Welfare workers try to clear computer center of public assistance recipients who invaded welfare computer center in Boston. (Boston Herald Traveler photo by Warren Patriquin).

Mass. Welfare Protest

DP Center 'Invaded'

By Edward J. Bride
CW Staff Writer

BOSTON — Security measures have been increased at the state Welfare Department's computer center, after scores of welfare recipients invaded, disrupted, and occupied the center, claiming the computer was withholding their checks.

James Sweeney, director of the local center, said that "a few things" had been done, including locking the center from the inside of the "regular old doors," and admitting personnel by recognition only.

Sweeney stated that more than a half-day's work was lost because of the invasion, which began during a lunch hour early this month.

Forty-eight of the welfare clients left the third-floor computer center at Sweeney's suggestion, heading for the first-floor section of Inquiries and Referrals, and leaving about 10 protesters in the center.

Aside from some power switches thrown, there was no tampering or damage involved because, as Sweeney explained: "There was no one who would know which buttons to press, or to mispress." He indicated that there was no vandalism, and that the other 10 "invaders" left without coercion, 3-1/2 hours after entering.

Sweeney reported that the one operator on duty in the computer room barely had time to cycle down the computer "in orderly fashion" so that nothing but time was lost.

The operator also refused to resume the job while unauthorized persons were in attendance. "Normal" operation was re-started at 3:45 p.m.; the job was

IBM Eases Contract Rules For Systems Engineering

By Frank Piasta
CW Staff Writer

WHITE PLAINS, N.Y. — IBM has softened its policies in Systems Engineering (SE) contracts.

Representing a liberalization of the rules specified by the company at the time software was unbundled, the changes should have a direct effect on IBM users.

Eliminated was the minimum requirement for SE services within a given time frame. Under the former policy, a user had to contract for a minimum of 18 hours of SE time within a three-month period. If group workshops were to be used, a minimum of four workshops had to take place within a six-week period.

Both of these minimums were discontinued as of June 30, 1970, IBM said.

Marketing Effort

A change in the use of SEs in relation to the marketing effort was also made, effective June 30. Before, the SE had to remain on IBM property during marketing. He could not work at the user's site until a contract for his services had been signed by the user. Under the revised plan, the salesman may make use of SE time before the sale is completed.

The SE can participate in any type of marketing activity, regardless of location. The marketing representative need not be present, according to IBM.

IBM pointed out that this does not change in any way the fundamental concepts announced on June 23, 1969, the unbundling date. The customer will continue to be charged for all billable services performed by IBM SEs.

An IBM spokesman defined non-billable as those services connected with sales. They could include such activities as the preparation of proposals, developing benchmark programs, and making timing estimates. The conducting of demonstrations and the surveying of a prospect's data processing needs were also mentioned.

An addition to the services offered to System/3 users was also disclosed by IBM. Called the Application Development Service, it will involve the writing of application programs by IBM SEs for System/3 users at a *fixed fee*.

According to IBM, the service will include the designing, writing and testing of programs in several application areas to a customer's specifications. Documentation for the programs will also be supplied.

The areas of applications will be order writing and invoicing, inventory accounting, accounts receivable, and sales analysis, IBM said.

Programmer Licensing Possible in California

By Phyllis Huggins
CW West Coast Bureau

SACRAMENTO, Calif. — California may become the first state to require licensing of computer programmers and operators.

Sen. Alfred H. Song (D-28th), chairman of the Senate Committee on Business and Professions, has called for hearings this fall to look into state licensing following the state's recent, computerized vote count debacle.

Song pointed out that computers are becoming more and more sophisticated and complex and threaten to invade the inner recesses of our private lives.

The vote count problem was cited as *"prima facie* evidence" of the need for competent operators of computer equipment. As he put it, "We have done nothing to insure that the human element necessarily involved in the operation of these sensitive machines is competent, honest, or trustworthy.

'Licensing and regulation of those who set up the programs for computer operations and operate the machines appears to be both logical and imperative. We need tough laws that protect the public interest and this is the direction that my committee will follow."

The first hearings are expected this fall and in addition to citizens who have had problems with billing systems and other computerized procedures, the committee will hear from computer manufacturers, schools for programmers and operators, the county registrar of voters, and various companies using computerized systems that have direct interaction with the public.

In the event that the hearings produce sufficient evidence of the need for licensing, legislation will be initiated.

The successful outcome of legislation would be the appointment of a board by the governor which would be composed of members of the public and professionals in the field to administer licensing standards.

Song noted that the state now licenses 800,000 people in various occupational fields.

ADR Temporary Restraint Order Limits Distribution of Free IBM T/S Program

ST. PAUL, Minn. — Applied Data Research Inc. (ADR) has obtained a temporary restraining order limiting the free distribution of an IBM time-sharing program similar to one which ADR sells.

In response to a suit filed by ADR June 25, IBM actually proposed the order to Federal Judge Philip Neville, who accepted and issued it on July 7.

The ADR suit seeks the withdrawal, or the competitive pricing, of a program called Conversational Remote Job Entry (CRJE), which is free because it was announced before unbundling.

IBM's accepted proposal allows the company to proceed with 30 tie-in sales of its System/360 with CRJE. The company agreed not to distribute the program elsewhere until after an August hearing on ADR's suit, requesting an injunction against the "bundled" arrangement.

The hearing, in effect, may also determine the merits of ADR's antitrust case, since the allegations are the same — that the bundled sales posture violates antitrust acts in restraints of trade.

In proposing the limited restraining order, IBM suggested that customers needed use of such a program to maximize their equipment. A company spokesman said that IBM presented the terms of restraint in order to protect those customers anticipating delivery of CRJE.

'Roscoe' — CRJE

ADR's program is entitled Roscoe, for Remote OS Conversational Operating Environment, and the company charged that the free distribution of CRJE constituted unfair competition and monopolistic practices.

In February, 1969, IBM announced that it would make available the CRJE package in June, 1970. At that time, ADR was nearly finished with the development of Roscoe, which it introduced, and made available, in September, 1969.

ADR charges that IBM's pre-announcement damaged ADR's market.

Both Need Time

Neville said that the restraining order was issued so that ADR and IBM would have sufficient time to prepare arguments on the tie-in issue of the 360 and CRJE.

ADR President John A. Bennett said that the Roscoe-CRJE competition presented an "immediate" problem to his company, which was why he is seeking "immediate relief." He concluded that the order was a step in the general direction of his request, but that he had been hoping for total restraint of the

Under $7,000
Low-Cost PDP-8/E Is Family-Compatible

By Frank Piasta
CW Staff Writer

MAYNARD, Mass. — Described by the manufacturer as the lowest-cost, full-scale computer currently available, the new DEC PDP-8/E sells for less than $7,000 and maintains peripheral and software compatibility with the four previous PDP-8 models.

The PDP-8/E features an unusual option that allows the user to configure his processor with 256-word segments of core memory set aside for use as read-only storage.

The basic core memory is 4,096 twelve-bit words, expandable in 4K-word increments to a maximum of 32K words. Cycle time of the PDP-8/E is 1.2 μsec/word. Add time is 2.6 μsec.

The PDP-8/E marks the first use of Omnibus, an internal bus system that DEC says allows processor, memory, and peripherals to be interfaced in any available position in the CPU with each slot in the bus electrically identical. Conventional back-panel wiring is eliminated, according to DEC.
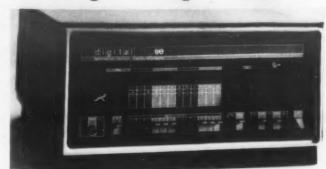
Sixteen new microinstructions have been incorporated in the latest of the PDP-8 series. These include four instructions related to the teletypewriter, five related to interrupts, seven associated with the multiply-quotient register, and a byte-swap instruction to facilitate half-word manipulation.

Compatibility

According to DEC, the PDP-8/E is software compatible with the older members of the family. The user, DEC said, can take advantage of seven years of software development.

Included in a list of typical software available for the PDP-8/E are four assembly routines, a PS-8 mass storage program development monitor system, a disk monitor system, and such language compilers as Dibol, Fortran, Algol, Focal, and Basic.

The DDT and ODT debugging packages can be used, and, in addition, DEC offers a variety of mathematical routines, utility programs, and maintenance and diagnostic programs for the new system.

Small in Size

Priced at $4,990 without Teletype and $6,490 with Teletype, the PDP-8/E is also small in size. Up to 32K words of memory and several peripheral interfaces can be contained in the basic 10-1/2 in. by 19 in. by 24 in. cabinet.

The history of the PDP-8 series has been characterized by a continuous policy of offering more power at a lower price. The PDP-8, introduced in November, 1964, at $18,000, was said to be the first computer priced below $20,000. It was followed by the less expensive PDP-8/S, and less than two years ago by the PDP-8/I, the first member of PDP-8 family to use integrated circuitry. the PDP-8/L was introduced two years ago.

First customer deliveries of the PDP-8/E are scheduled for Jan. 1, 1971.

Digital Equipment Corp.'s PDP-8/E

'There Go Da Judge'!

PAINESVILLE, Ohio — The computer was picking citizens for jury duty when "here comes da judge."

Judge Robert L. Simmons, who presides in Common Pleas Court here, was selected for jury duty in one of the other courts. Saying he would "love to do it," the judge noted that he was not qualified. He mentioned objections which could be levied by other jurors, or possible inherent differences of opinion which could create prejudices.

Names and addresses were used in the data base, but not occupations. There are 70,000 citizens for each juror needed in this area but the necessary qualifications in the source data gathering were incomplete.

Features \ Model	PDP-8	PDP-8/S	PDP-8/I	PDP-8/L	PDP-8/E
Min-Max Memory Sizes (words)	4K to 32K	4K to 32K	4K to 32K	4K to 8K	4K to 32K
Memory Cycle Time (μsec)	1.5	8	1.5	1.6	1.2
Add Time (μsec)	3	36	3	3.2	2.6
No. of Registers	8 (auto-indexing)				6
Effective Transfer Rate (word/sec)	666K	N/A	666K	625K	715K
Direct Memory Access Channels	9	9	9	9	12
Tape	Yes	No	Yes	Yes	Yes
Base Price (4K Words and TTY)	$18,000	$9,995	$12,800	$8,500	$6,490

Comparision of the five models of DEC's PDP-8 minis. Among the features common to all models are a word length of 12 bits and a repertoire of eight basic instructions. Memory is expandable on all models in 4K increments, and all are equipped with a cycle-stealing channel access. Disk storage may be used with any PDP-8.

Estonia Has Plans to Decrease
The Number of 'Swinging Singles'

MOSCOW — Estonia, a high-divorce area on the Baltic Sea, has instituted computerized dating in an effort to bring together the growing number of single people in the cities.

Young Estonian agricultural workers cannot find husbands or wives among the agricultural community, so they flock to the cities, according to the Soviet newspaper, Literaturnaya Gazeta.
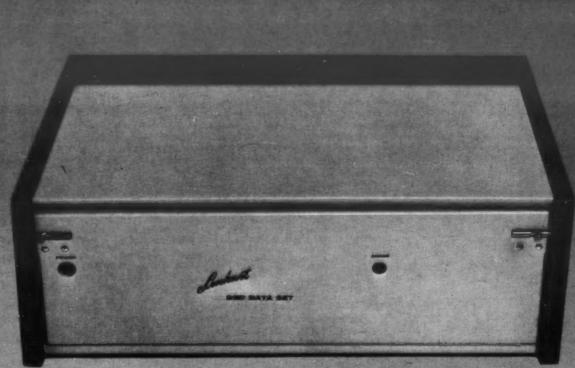
In addition to the computer, the planned "bureau of acquaintance" will include a staff of psychologists and attorneys specializing in family problems, and "medical sexologists" to advise prospective newlyweds about "things you can't even discuss with close friends or relatives," the paper said.

Officials planning the bureau include the chief of the marriage registration bureau, the cultural director of trade unions, and the deputy chairman and the secretary of the Tartu City Council.

Applicants for computerized dates will supply a photograph and answer a number of questions such as age, number of children (for divorced people), size of apartment and amount of money available.

The bureau hopes that the computer will help lower the divorce rate which has risen dramatically.

Most DP Centers Lax in Arranging Backup Facilities

By Peter F. Carr
CW Staff Writer

Most data processing installations in the U.S. have not made adequate provisions for backup facilities in the event that an unforeseen disaster renders their equipment useless for any extended period of time, according to a recent poll conducted by CW.

An estimated 75% of the companies contacted indicated that they had made no formal arrangements for backup. Although many managers had considered the possibility of equipment failure or sabotage, most expected that they would be able to find time and compatible equipment at a neighboring installation, in such an event.

Although inquiries have established in many cases that such optimism is unjustified, the CW poll indicates that most managers have not used to their advantage the costly lesson to be learned from a breakdown in, or loss of, equipment.

But many did express their concern over recent events, such as the bombing of computer centers, and said that they were now "looking into" the possibility of establishing reliable backup.

IBM View

A spokesman for IBM said that although the company did not dictate to its customers what they should provide to protect themselves, "a decision about backup should be made, and plans prepared before a disaster strikes.

"The eventual decision might be to function without any backup whatever for good economic reasons but management should make a definite decision," he said.

Most experts in the field of security for computer installations agree that one of the most important considerations in planning a computer center is the necessity for backup facilities.

The number of installations that were not struck by some form of breakdown in past years are few, and recent reports indicate that electricity "brownouts," for example, are likely to increase the probability in the future.

Backup facilities run from complete backup consisting of a duplicate system at another location down to no backup at all in cases where the DP done is minimal.

The decision on the amount of backup necessary depends on many circumstances, according to Robert V. Jacobson of Bradford Associates.

To assist in determining the need for backup facilities, Jacobson has devised a system of economic analysis which he calls the cost of delayed processing. This process can be used by every DP manager to determine his particular requirements, Jacobson said.

'Quantitative'

"The careful manager will base his estimate for backup capabilities on a quantitative analysis of the number of delays, rather than on instinct," he said.

Jacobson's estimate of the cost of delayed processing is computed on the assumption that every process performed has some timeliness factor associated with it. That is, there is some point in time beyond which it begins to cost the company money not to have the process completed. For example, in banking operations, checks have to be sent to the clearing house by a certain time.

If the computer breaks down and the checks remain unsorted, the bank is charged for each unit of time beyond the allotted deadline.

To arrive at the cost of delayed processing, each function carried out by the computer must be examined, and an estimate made of the cost caused by potential breakdowns, such as by hardware failure, or a breakdown in communications circuits, or by an accident such as a fire, or by sabotage.

To reach an estimate of the total cost, the potential costs for each of the functions performed by the computer have to be added up.

Implications

This total cost may justify backup facilities beginning with the availability of duplicate or alternate hardware at an alternate facility. But backup facilities do not imply that a manager must have a duplicate system or nothing at all. A duplicate system is an expensive proposition. If it is not justified economically, a manager can overcome the problem by keeping a complete spare set of crucial parts in the building.

In addition, manufacturers offer maintenance contracts which vary in cost.

Successful operation at an alternate computer is possible only if plans have been made in advance and then demonstrated to be workable by actual test. The alternate computer must be compatible with in-house processing. This can be accomplished by either using a computer with a compatible hardware configuration or by maintaining a parallel set of software compatible with the computer that is available for back-up, Jacobson said.

But both of these approaches present difficulties. Just because two computer configurations of the same model have the same options, memory size, and list of peripherals, it does not mean that software will be interchangeable. The final proof of compatibility is to run all programs successfully on the alternate system.

Functionally Compatible

Not only must software be compatible with the computer on which it is to run, but it must be functionally compatible with the software being used on the in-house computer, Jacobson pointed out.

In addition to providing for brief interruptions, contingency plans for an on-line system must include provisions for responding to a catastropic loss at the computer center, he said.

In addition to a complete backup systems, a manager can plan for manual operation supported by off-line batch processing to bring files up to date while a new system is procured and installed. Long lead time hardware items can be stored so that the system can be put into operation in the shortest possible time.

But for the company with several on-line computer systems, the added cost of one more computer may be acceptable, if it is normally used for development and testing of new programs, Jacobson said.

Welfare DP Office Tightens Security

restarted so that, according to Sweeney, a total of six hours was actually lost.

'Procedures Problem'

Of the 48 who presented their grievances to the division of Inquiries and Referrals, Sweeney claimed that 29 had in fact received their checks, on time, and in the correct amount.

He said that "procedures" had broken down in the other 19 instances, a re-occurrence of the problems that loomed this past spring [CW, June 10].

Those problems involved welfare employees, not excluding those preparing reports for data entry in the key/tape section, who had reportedly not done their job completely, or properly, or both.

While not accusing any individual category of social worker, Sweeney did say that the lack of the 19 checks was an input problem, physically unrelated to the computer.

Three checks were prepared, but were mailed to the wrong address.

Computer Blamed Again

This spring, welfare recipients and social workers accused the computer, an IBM 360/30, of holding back checks from about 600 recipients.

In most cases, obsolete addresses caused the delay. The addresses were corrected and, since that time, Sweeney reports, "We've had very few complaints."

The Post Office does not forward public assistance checks, so the addresses were corrected then, when the checks were returned to the welfare office for the first time.

In other cases, slowness in entering or verifying changes caused the delays.

Sweeney indicated that some of the slowness was the fault of the social workers themselves, who had failed to enter changes in dependency, address, or eligibility. These same social workers accused the computer of withholding checks from their clients, and some were "docked" two days' pay for being absent from work in April during demonstrations against the computer.

Distribution of Free IBM Package Limited by ADR Restraining Order

free distribution of IBM's program.

ADR is one of five firms suing IBM in antitrust actions now before Neville.

The other plaintiffs also allege IBM's former bundling was in violation of the antitrust act, but told Neville their complaints are broader than those of ADR in this litigation. They did not join these injunction proceedings.

IBM "wouldn't speculate" on what effect the Roscoe restraining order, or the August hearing, could have on the five-pronged suit.

Nor would the company spokesman comment on the speculation that IBM's proposal of the restraining order was an admission that it needs time to prepare for a possibly significant turn in the big case.

Chess Players Checkmate Computer

FLINT, Mich. — Five people played five chess matches against a computer here, and four of them won. The loser, according to the Flint Chess Club, was a teenager just beginning the game.

The computer, nicknamed "J Bit" by the club, was programmed, a winning contestant said, to think two moves per second and could sort 1,800 possible moves for each move.
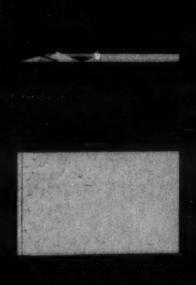
He said that he felt sorry for the computer because it had taken, he claimed, 15 minutes on one move in a game it lost.
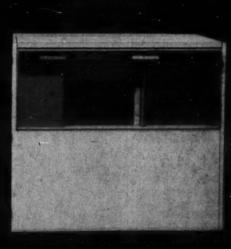
According to the club, the computer had been "trained" by a chess master for three years. No club member would say whether the programmer was also a chess expert, or if the chess expert was a capable programmer.

Sides Square Off on Environmental Data Bank Bill

By Edward J. Bride
CW Staff Writer

WASHINGTON, D.C. — Educators, users, and computer experts aligned themselves recently against government officials who told a House committee that a proposed national environmental data bank was not feasible, or at best "premature."

Subject of the hearings, conducted in June by a subcommittee of the House Committee on Merchant Marine and Fisheries, was HR 17436, the National Environmental Data Bank Act.

The legislation is intended to amend the National Environmental Policy Act of 1969 to form the bank and a "data bank board" to supervise maintenance of "the central national depository of all information relating to the environment."

Predictive Models

The proposed bill would direct the board to "develop predictive ecological models as well as actively seek and procure useful environmental information in any other practical way."

The board would also be charged with analyzing "legislative and major operational proposals" of the various executive departments with regard to their "probable impact on the environment."

Government officials insisted that the proposals were "pre-mature," that the state of the art does not allow the computerization of ecological data, and that some federal agencies already had duties and authorities proposed for the data bank board.

Officials of the Departments of Agriculture, Transportation, Housing and Urban Development, and Health, Education, and Welfare all recommended that the law not be enacted.

Theodore C. Byerly, coordinator of environmental quality activities of the Department of Agriculture, claimed that the data bank would "complicate and duplicate on-going statistical gathering activities."

He added that "effective national data bank operation probably could not be achieved at a reasonable total cost within the current state of the art."

The representatives of the other three departments all used the word "premature" to describe the proposal, with one official noting, "We have so much more to learn before we can properly design and use such a system."

Maine Witnesses

Such a system has been designed, and is being used by the state of Maine, which sent two witnesses to the hearings.

In a joint statement, Donald K. Christie and Phillip L. Goggins reported that computer technology had helped "to define our problem areas more adequately," adding, "Our living standards will be affected by the decisions we make today."

The statement noted that Maine had developed "a plan, a process, and a system," and that this had been accomplished by selecting our objectives carefully, developing a plan of action and seeing that plan executed."

The state's requirements were presented to Computer Applications Inc., (CAI) whose credentials includes participation in state physical and recreation planning, social planning studies for Vermont, Illinois and New York, and various telecommunications and engineering applications.

The CAI staff available to Maine included geologists, biologists, water pollution experts, cartographers, space scientists, land use planners, engineers and system engineers.

CAI and the Maine officials recommended "preliminary steps that can be taken at once to implement the data bank."
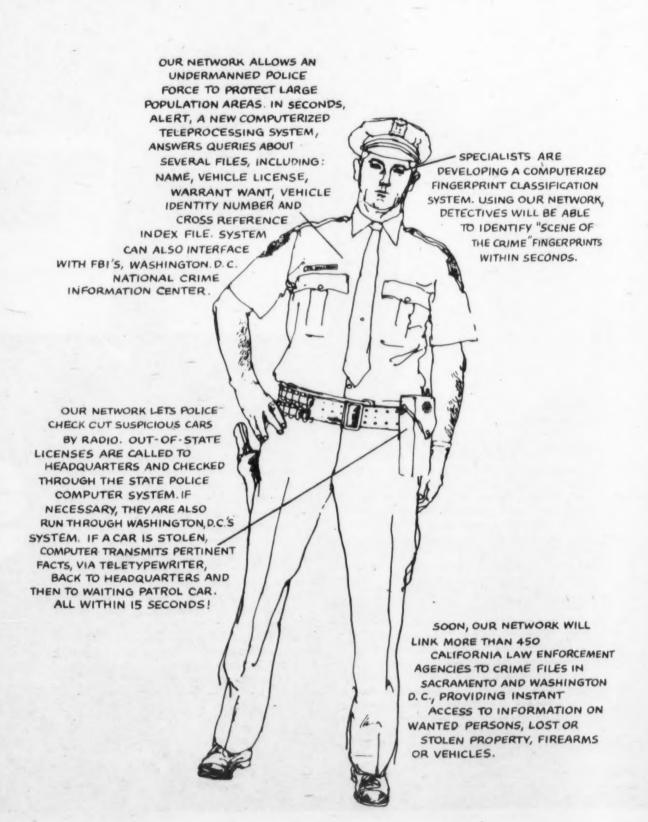
The steps included forming a study committee to establish goals, developing a time-phased plan for implementation and a management plan to provide for proper integration at various levels, and constructing economic models so that tradeoffs could be ascertained.

Expanded System Foreseen

The director of research at Kentucky's Murray State University, James B. Shrewsbury, offered to undertake a "pilot model" for the bank, limited to water quality control "but completely usable as part of an expanded system."

Shrewsbury proclaimed: "I see no alternative to establishing the proposed bank."

EIA Gives Aid To U.S. Agencies

WASHINGTON, D.C. — An Ad Hoc Committee of the Electronic Industries Association (EIA) has recommended several procedures for the U.S. Government's defense-oriented agencies to help them streamline their computer operation.

The report of the Ad Hoc unit suggested development of a description of the inventory of existing hardware and software systems within the defense establishment.

The major function of the Ad Hoc group is to deal with a number of problems defense agencies are having in operating the variety of interconnected EDP systems they run and maintain. The Air Force, in particular, has reported difficulties in interconnection of a variety of systems purchased over the years. Because it has become necessary to link these systems horizontally, the AF has asked for assistance from industry.

Other recommendations included that existing standards be reviewed and new ones developed, and that use of a systems approach and cost effectiveness analysis be used.

New Warranty Covers Parts and Labor

System/370 Is Easiest Way for 360 Users to Upgrade

**By Don Leavitt
and Frank Piasta**
CW Staff Writers

NEW YORK — The users of IBM System/360 medium-to-large-scale systems that are running short on memory and CPU power should welcome the 370 announcement with open arms.

The 370 represents the easiest way yet for a 360 user to upgrade his system. He can wheel the old processor out, the new one in, plug in his peripherals and run his 360 programs at speeds up to four times as fast as before. However, the transition from a 360/50 to a 370/155 with the same core capacity would increase the monthly rental charge from 23% to 59%, depending on the memory size.

If he is multiprogramming his system, the user will be able to make optimal use of the higher internal speed, while the larger core availability makes possible more resident partitions.

The increase in internal power is in large part due to the adoption in the 370 design of the buffer concept that IBM used previously in the 85 and 195 models of the 360 series. The buffer works on the premise that immediately adjacent data in memory is usually used at nearly the same time. A program data request will result in the checking of buffer storage for the requested information.

If it is not already in the buffer, a segment of data 144 bits wide, 288 bits on the 165, is moved from main memory to the buffer, while the data specified by the program is continuing onto the processor.

According to IBM's statistics, there is a 95% probability that the next access for data will find it already stored in the buffer, enabling the system to take advantage of the very high buffer speeds. One of the best features of the buffer is that the user does not have to allow for it, the only effect being higher performance.

The buffer on the 155 has a capacity of 8K bytes and a speed of 230 nsec for four bytes, considerably faster than the 2.1-μsec main memory speed. The 165 accesses eight bytes in 160 nsec. Main memory speed of the 165 is 1 μsec. In addition to the standard 8K buffer on the 165, an additional 8K may be ordered.

As far as peripherals are concerned, all but a relatively few of the current line of 360 peripherals in the user's system can be used. A spokesman for an independent peripheral manufacturer pointed out that this includes such items as compatible disk and tape drives in current use with the 360s.

The spokesman told CW that his company has under development a product that will compete in performance with the 3330 disk storage system.

Technically, there may be no program products that are unique to the System/370, but details of the software enhancements planned for the new system are both dramatic and significant for the user.

Of particular interest to communications users for example, is the Ascii support for magnetic tape for data interchange, that is included in both the Cobol and the Fortran revisions.

And with the PL/1 Optimizing Compiler, the user has three distinct options: he can have fast object execution, reduced object program size, or fast compilation.

Additionally, the PL/1 user is able to override some of the default parameters normally found in earlier compilers. And he finds improved and extended diagnostic messages at both compilation and execution time.

Some Restrictions

Within the PL/1 program itself, the user is able to communicate with Fortran and Cobol object modules, subject to a variety of restrictions.

Other enhancements to the ANS Cobol include expansion of the ON statement, and improvements in the program listings. IBM said that these include a global table, literal pools and register assignments, in addition to a sorted cross-reference list.

The Fortran H compiler and library changes, beyond the Ascii support, include the ability to accept asynchronous I/O, with related improvement in overlap processing. In floating-point arithmetic, conversion from single to double precision, and from double to extended precision, is possible at compile time without reprogramming. The new package also provides automatic FUNCTION selection. No FORMAT statement is required for data that is formatted, IBM said.

While the user has the use of the extended instruction set indirectly in the high-level compilers, he can use them directly in the new version of Assembler H. With the new capabilities, programs at this level should become even more efficient than before, IBM noted.

IBM has said, incidentally, that versions of the program products are being prepared specifically for use on 360s, to include all the improved logic but none of the extended instruction set that is inexecutable on the 360.

Model Feature	360/40	360/50	370/155	360/65	360/75	370/165	360/85	360/195
CPU Monthly Rental ($K)	2.7 to 10.2	8.3 to 19.9	21.5 to 45.2	19.9 to 51	31.7 to 60.3	39 to 70.8	62.2 to 145.5	96.8 to 167.8
Min.-Max. Memory Sizes (K bytes)	16 to 256	64 to 512	256 to 2,048	128 to 1,024	256 to 1,024	512 to 3,072	512 to 4,096	1,024 to 4,096
Cycle Time/ Byte (μsec)	1.25	.50	.06	.09	.09	.02	.06 or .07	.09
Byte/ Access Cycle	2	4	2	8	8	8	16	8
No. of Channels	3	4	6	7	7	12	12	13
Buffer Memory Speed (nsec)	none	none	115	none	none	80	80	54
Inter- leaving	none	none	none	2-way	2- or 4- way	4-way	2- or 4- way	16-way

Figure 1. Comparison of IBM 370/155, 165 with some 360s

370 Gives Users Easiest Means Of Upgrading

Although IBM has abandoned the conventional paper or Mylar carriage control tape on the 3211 high-speed printer, it has replaced it with what amounts to an electronic copy of the tape, which is loaded into the forms control buffer at the same time the user's program is loaded into core.

This cuts down the operator's work between jobs without adding any new control considerations to the programmer's problems. He uses a chart similar to the old carriage tape layout sheet to show where he wants "channel punches."

The user will probably benefit from IBM's determination to learn from the mistakes made in connection with the 360. Things such as lack of compatibility with any existing line of computers made transition to the 360 difficult for the user. Late shipments and unhappy experiences with emulation damaged IBM's reputation with its customers, the company admitted.

These were in large part eliminated by making the 370 compatible with the 360, allowing the continued use of proven software and peripherals. Extensive testing, more than 14,000 hours according to B.O. Evans, president of IBM's System Development Division, before production will reassure the user that his system will work according to specifications.

The incorporation of error-correction code circuits and the introduction of CPU Retry will probably have a favorable effect on the total performance of the 370 and on the confidence of the user in his system.

The increase in CPU performance will bring with it an increase in monthly rental. A 256K 155 CPU will rent for $21,500/mo; the 384K processor for $23,025/mo; while the 512K Model, equivalent in size to the largest 360/50, carries a price of $24,550/mo. Memory sizes of 768K, 1,024K 1,536K, and 2,048K are available as well. The largest is priced at $45,150/mo for the CPU.

165 Processing Units

Prices for the 165 processing units range from $39,000/mo for 512K of core, to $70,800 for the 3,072K CPU. Intermediate sizes of 1,024K, 1,536K, 2,048K, and 3,072K are available.

Each of the program products will be available on a monthly lease agreement, as noted previously [CW, July 8].
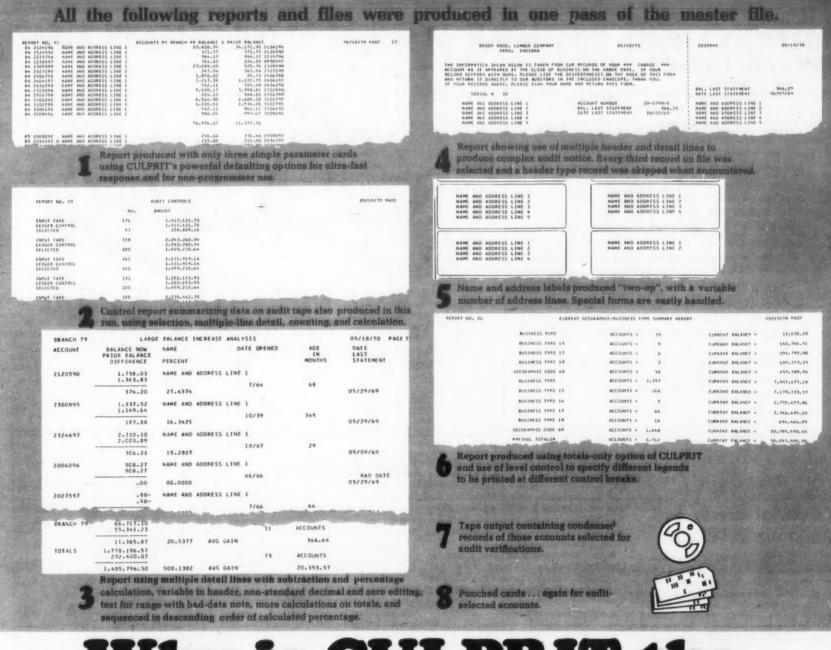
The 370 also marks a departure from 360 policy in maintenance pricing. The CPU, including storage on the 360, carries a one-year warranty on parts. The 370 CPU, storage, and in the case of the 165, the console, are now covered by a one-year warranty that includes both parts and labor. An IBM spokesman said that this new policy would delay the need for purchasing maintenance contracts on these units for one year.

Study May Hit Faults Of 2 U.S. Agencies

CW Washington Bureau

WASHINGTON, D.C. — A report blasting the failures of two federal agencies to control the proliferation of government computers is expected to be released this month by the General Accounting Office (GAO).

More specifically, the report, according to Washington sources, will cite the shortcomings of the General Services Administration (GSA) and the Bureau of the Budget (BOB) to implement the Brooks Bill, a law covering the U.S. Government's ADP operations.
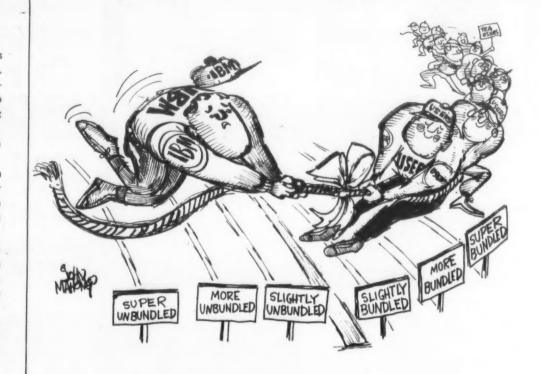
Editorials

IBM's New Outlook?

IBM's liberalization of its systems engineering policies may portend belated recognition of the user's needs. Last year IBM's unbundling announcement clearly limited the SE's on-site involvement to a pay-as-you-go situation. Since then, various sources have reported that SE services were in some cases being offered free.

Now IBM has altered its SE regulations to permit more free, on-site help.

In addition, the new 370 systems will include a one-year warranty specifying free parts *and labor*. For the prospective 370 purchaser, this will forestall the necessity of signing a maintenance contract for a full year.

The new 370/155 and 370/165 will be compatible with existing software and peripheral devices. Presumably this interchangeability will allow 360 users with independent peripherals to switch their non-IBM devices to the 370 CPUs.

Although these user-oriented changes are motivated by IBM's marketing goals, it is heartening that the company is becoming more aware of the user's needs.

Letters to the Editor

Complacent Industry Must Accept Honest Criticism

There has been a spate of letters debating the position Dr. Hamming and I took in a recent symposium. Lest confusion set in, I would like to amplify my position.

My criticisms of programmers came during an examination of user needs in the next decade; it was not directed at all programmers, although a great majority exhibits one or more symptoms. I can equally criticize systems analysts and managers, and often do. Again, I am pointing to obvious weaknesses in some and not necessarily in all.

However, I strongly feel that if our industry cannot accept honest criticism and persists in self-congratulation in the face of its poor performance, we are dooming ourselves in the eyes of top management. Our fatuous complacency continues to amaze me; we bull ahead with some of our mistakes like there is no tomorrow, and defend ourselves with sophomoric arguments and self-righteous indignation.

Perhaps our current economic recession will be most helpful in straightening out those upright souls who believe themselves perfect. Budget contraction, unemployment, staff reduction, and project suspension all are phrases unknown to the self-righteous quasi-managers in our field. The real test is yet to come.

My position on programmers is simple, and derived from five years of active programming experience and self-examination.

Many programmers:

● Are non-professional in their daily behavior.

● Act as prima donnas in their interpersonal relationships.

● Are not loyal to their companies or their managers.

● Fail to exercise responsibility over their own use of resources — their time and machine time.

● Exhibit psychasthenic tendencies.

● Make themselves indispensable by improperly performing their jobs.

● Insist on advancement into jobs for which they may be totally unqualified (such as systems analysis).

● Create problems with operations personnel because of their superior attitude

and unreasonable demands for service.

● Demand salaries and fringe benefits not commensurate with their training, experience, ability or attitude.

● Consider themselves near-perfect in direct contradiction to most of the facts.

I have similar lists for systems analysts, managers, operators, garage mechanics, and TV repairmen.

Honi soit qui mal y pense!

Dick H. Brandon
President

Brandon Applied Systems, Inc.
New York

Responsible Planning Needed in Technology

I have read with interest the Letter to the Editor from H.T. Larson in your June 17 issue. Because of a conflicting engagement I was unable to attend the social implications session at the Spring Joint Computer Conference and cannot comment on what occurred.

Like Larson, I am concerned that the chairman and two of the panelists did not show up. But I would suggest to Larson that absenteeism at social implications sessions is not limited only to public panels.

In Las Vegas last November, the Social Implications Committee of the IEEE computer group scheduled a meeting; the location was well marked and in front of the meeting room was a sign in six-inch letters announcing that this was indeed the meeting of that committee.

Unfortunately neither the chairman nor any member of the committee chose to attend, and those few interested souls who came by finally left in search of greener pastures.

In Atlantic City in early May, so far as I could make out from the material handed out to the public, the IEEE Social Implications Committee did not even schedule a meeting.

I have observed much interest among the computer professionals about the effect of the computer on our society, from the chairman of IBM on one hand to programmer trainees on the other. I do not share Professor Dial's belief as set forth in the printed proceedings of the May session that "we will learn of the social impact of computer technology

much as we learned of the profound impact of the automotive industry — considerably after the fact."

Many people are giving hard thought to the deleterious aspects of computer technology, and hopefully most, if not all, of these may be avoided by responsible forward planning.

But time is short, and what we need are not fulminations like Larson's, decrying those who apply the techniques that have been so effective on the campuses to try to stir the soul of the computer community. Let us rather join together to present to the American public, and to the world, solutions instead of rhetoric.

Robert P. Bigelow

Boston

Noise Levels And DP Centers

Your July 1 issue contains an excellent article about the noise level in data processing centers. However, the accompanying picture (page 1) demonstrates a common fallacy. If Mrs. Weidner wants to hear the other party to her conversation, she should put her left hand over the mouthpiece, not her left ear. This action removes the room noise from her right ear which it enters via the receiver, allowing her to hear the conversation. Of course, she must remove her hand when she talks.

David A. McBlain
Director of Computing Services

Austin College
Sherman, Texas

URS Quite Active In Other Fields

Re: Dicomes on Stocks [CW, June 24], Good Lord, Sir! Can you mean what you say in your article on the Software and EDP services group? "Unlike some of our other rated stocks, the above companies have no basic product mix which we can consider outside of their prime business."

As far as URS is concerned, at the end of our last fiscal year, Oct. 30, 1969, our computer services group accounted for some 37% of revenues (compared to 46% for our architectural and engineering planning and design group).

In 1968, the comparable figure was 62% and in 1967, 80%. In two years time,

while revenues (as reported) increased from $5,000,000 to $26,000,000 while the relative contribution of the computer services group decreased by more than a factor of two.

Does that suggest that we have been "investing all (our) assets in a single field?" Actually, with stretchouts in some of our EDP services work having occurred, the percentage noted above has decreased still further from last year.

There can be many reasons for assigning the rating to URS that you did — reasons that I clearly disagree with. But the suggestion that our sole activity is EDP services is dead wrong.

Others on the list, most notably Planning Research, can lodge a similar complaint.

Kenneth Kaplan
Vice-President

URS Systems Corp.
San Mateo, Calif.

DiComes replies: I consider that since your company is a services company, you have no real product mix. Several departments operating along a basic pattern do not create a product mix. Ed.

An ACM-Sponsored Standards Group?

I heartily agree with Norton's comments [CW, June 3] about the need for standards in this industry of ours.

But, enough of this lip service! Why doesn't some organization like ACM pull together a standards group for the industry? *Computerworld* might even get the ball rolling with a newspaper campaign. A group of this type would certainly speed up the Ansi process by feeding it digested recommendations.

R.F. Michaels, Manager
Corporate Information Systems
Development

Reliance Electric Co.
Cleveland, Ohio

Computerworld welcomes comments from its readers. Preference will be given to letters of 250 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 797 Washington Street, Newton, Mass. 02160.

Some People Should Learn to Read and Then Criticize

Last week I said that I was going to comment about what action could be taken if an installation wanted to do something about its Cobol overhead. I will — but not this week. This week let us deal with something really important (and I do not mean that IBM announcement either!).

Let us consider instead whether people can read. People like you and me. Data processing managers, and self-styled experts. Programmers and analysts and all the whole sorry gang of us in the industry.

Stop — Think!

Let us think about that for a few moments.

I want to think about it because of the way that many of my correspondents write — and keep on writing — about my article "Do You Know What Your Cobol Overhead Is?"

I want to think about it because of the comments from

Harry T. Hicks Jr. of San Francisco, for instance. He starts by recalling that we all knew about Cobol inefficiencies back in 1960-62, and states McCracken answered my argument in 1962

> Alan Taylor, consultant, writer, and former editor of *Computerworld*, is president of Computer Management Aids Corp. of Framingham, Mass.

by showing that my figure of 50% overhead was too small — he reduced times from 80 seconds to eight seconds or 90%! McCracken was comparing Cobol to Assembly Language, NOT Machine Time as I am doing.

I want to think about it because he summarized his letter by saying that the fact that Cobol run times can be reduced should not be used to mount an attack on the Cobol specifications, or to question whether the language is worthy of use. Are

we to accept blindly these specifications? Can't we request that they be improved to allow us to do a more efficient job? Nor did I say that Cobol is "NOT worthy of use."

I want to think about whether or not people can read because another Californian, Kenneth P. Seidel, objects to my "bandying about percentage measurements of inefficiency and alleging that they are intrinsic to Cobol overhead." He also thinks that finding fault with the designer of a tool rather than with its uninformed user is stupid. In the article nothing was implied — let alone mentioned — about the designers of Cobol.

I want to think about whether or not people can read because all these arguments are confusing programs with programming! And programs and programming are just not the same thing.

Cobol does an excellent job of saving programmers' time, but

The Taylor Report
By Alan Taylor

that is not — and was not — the subject of the article. My subject was the Machine Time (and believe you me, machines still cost a lot more than programmers) that was being wasted while Cobol programs are running. Actually, I do not mind being criticized, for this shows the strength of the point being questioned.

But . . . the Point Is

My point is that hundreds of millions of dollars of Machine Time are being wasted every year by machines running Cobol-compiled programs — and anyone who thinks it is unfashionable to agonize over that would not last long as my consultant.

My point is that uninformed users do not stand a ghost of a chance of using Cobol efficiently when the "Great Ones" of the Cobol world continue to keep

them uninformed.

And do not tell me that the *Journal of Cobol Development* keeps users informed. That horrible thing does not even have the decency to tell you what parts of Cobol have been changed without our knowing about it in advance, never mind why the changes were made or what we should do about it if we do not like it!

My point is that I never said that inefficiency is intrinsic to Cobol writing — but I did ask, and I continue to ask as to whether or not Cobol specifications are encouraging inefficiency.

Why Do I Ask It?

● Because I know very well that they are — and that far too little attention is being paid to this fact.

● Because even when compiler designers do provide advice, hardly anyone reads it.

● Because far too few users have only the remotest idea of how important it is to them — and all of the others therefore assume that because our great leaders are not agonizing about inefficiency that it cannot be very important.

● Because the standard of 1970 Cobol in this regard has not even reached the standards we had when I started writing my first compiler. And that was 13 years ago.

Letters to the Editor

What Kind of Truth For Money Spender?

Alan Taylor [CW, June 10] is substantially correct when he claims "computer experts" are not "information processing experts" and conversely. Careful examination of most of the second generation and all of the third generation (thus far) computer history suggests a related hypothesis, viz:

The amount of reasonably accurate information transmitted bidirectionally between the computer experts and people who buy computerware (whether "hardware," "software" — or "underware," that splendid euphemism due to Dick Hamming, apparently) is inversely proportional to the amount of money being spent, with certain important exceptions whose effects are now being observed in the "commercial time-sharing" segment of our business.

Occasionally, of course, these two "experts" are blended in unique, exciting individuals named . . . oh, surely we remember *those* names: Armer, Bemer, Fein, Grosch, Hamming, McCracken. They make our lives somewhat richer and more meaningful by telling everyone the truth. Most of us are listening to the truth, or as much of the truth as possible. However, it's still the nature of this strange business in which we find ourselves that the big money spenders (again, it's worth remembering it's mostly "public" money!) are not listening to quite that kind of truth.

I think I know why, as it happens, but would rather read about it in *Computerworld*, which only Paul Armer seems to "catch with its pants down" (in Alan's phrase and as I noticed in these pages on April 22!).

> Daniel F. O'Connell
> Independent Consultant

Palo Alto, Calif.

Lack of Integrated Cobol/Hardware Design

In reference to the Taylor Report of June 3 on Cobol overhead, I am quite certain that specific cases can be presented to support Taylor's every contention, the primary one being that the Cobol Language is the root of the problem. The problem in general, however, is not Cobol, but rather the lack of integrated Cobol/hardware design.

Hardware systems have been, and are being, designed for the primary purpose of astounding the user community with phenomenal feats at incredible speeds except producing ef-

ficient object code from Cobol source language programs. What good is highly sophisticated hardware when you are forced to degrade the overall system through the use of inefficient and disintegrated software to reap the purported "benefits" of the system?

> L. Edward Saus, CDP
> Programming Supervisor

Sugardale Foods, Inc.
Canton, Ohio

Project and People Control—Part IV

Effective Intermediate and Long-Range Planning a Must

By Elliot Raphaelson
Special to Computerworld

This is the fourth and final article dealing with effective control techniques. The three prior articles [CW, June 10, 17, 24] dealt with project control techniques for time and ma- *terials and fixed price contracts and individual controls. The subject of this article is effective intermediate and long-range planning.*

One of the major, potential pitfalls in the consulting business is having too many people un- assigned at one time. This is a major problem, especially for a small organization, when a large contract ends. One way to help alleviate this situation is by phasing personnel out of large projects gradually.

It is essential that management be informed continually as to personnel becoming available for new assignments. Figure 1 illustrates a sample report which identifies all the individuals in the corporation who are completing an existing assignment and can be assigned to a new one.

Parameters

Although the report is indicated as biweekly, and identifies individuals expected to be free within a month, these parameters can be modified to fit the operating environment of each specific consulting firm.

Individual	Anticipated Date Available	Anticipated Next Assignment	Anticipated Date Next Assignment
Joe	1/30/70	ABC	2/1/70
Cindy	1/30/70	ABC	2/7/70
Marge	2/15/70	None	
Harry	2/15/70	DEF	2/16/70

Note: Individuals included on this report include only those available for new assignments now or within the next month.

Figure 1. Personnel Availability Status Exception Report (Biweekly)

Month 1				
Individual	Job Assignment	No. Billable Hours Possible (1)	No. Billable Hours Estimated (2)	Non Billable Hours Estimated (1)—(2)
Joe, Henry, Mike	ABC	160	152	8
Harry	DEF	80	76	4
Harry	GHI	80	70	10

Month 2				
Classification Individual	Job Assignment	No. Billable Hours Possible (1)	No. Billable Hours Estimated (2)	Non Billable Hours Estimated (1)—(2)
Joe, Henry	ABC	168	160	8
Mike	DEF	168	160	8
Harry	GHI	168	80	88

Figure 2. Optimum Assignment of Personnel Projection (Monthly)

Figure 3. Personnel Requirements by Account (Monthly). Six Month Projections.

Figure 4. Projected Personnel Shortage or Overage (Monthly).

Viewpoint

One of the most important advantages of using this reporting scheme is to avoid the situation of hiring an individual this week only to discover two weeks later you have a competent staff member available who cannot be placed for an extended time frame.

Long-Range Planning

A consulting firm cannot succeed without effective, long-range planning. In order to do this successfully, the company must project personnel require- ments for each account as well as individual assignments on these accounts. Figures 2 and 3 illustrate one way in which these projections can be made.

Figure 2 represents the optimum assignment of people as projected by the systems and programming manager.

Figure 3 represents the projected personnel requirements for each account. This projection would probably best be prepared jointly by the marketing staff and the systems and programming manager.

Figure 4 illustrates a summarization of Figures 2 and 3 combining the results of the match between personnel requirements and personnel availability. In the example chosen, Figure 4 shows a short-term requirement for five additional staff members diminishing shortly to four and within two months to zero. In approximately three months, there will be six staff members with no assignments in sight.

Management Decisions

Taking a short-range approach, management would hire five people, and face the prospect in three months of having 11 people on the payroll not producing income. Naturally the decisions to be made still fall on top management, but given the kind of information available from Figures 2 to 4, the decisions made will reflect all available knowledge compiled from the marketing staff and from systems and programming management.

Elliot Raphaelson is director of research and development for CGA Computer Associates, Inc.

'Deep/360' Alters Data Exceptions During Testing

By Don Leavitt
CW Staff Writer

BOSTON — Programmers working in either BAL or Cobol on the 360 can have more effective test sessions by using the Data Exception Error Protection (Deep/360) DOS support package available from Macro Services Corp.

When possible, Deep/360 modifies otherwise unacceptable data fields and re-executes the instruction affected by a data exception, allowing the test to continue.

According to Macro, data exceptions are the most common problems present during testing; but they are generally the results of minor programming or data errors. By working around these minor problems, Deep/360 test sessions run to completion, or until a more serious form of program check is encountered,

requiring cancellation and off-line attention by the programmer.

Although it works around data exceptions, Deep/360 does not bury them. Rather, it lists them on the console by location and with a message indicating what action was taken by Deep/360.

Each time a data exception occurs, Deep/360 examines the data that caused the check. If Deep/360 cannot find the error or cannot fix it, a message to that effect is printed and the offending instruction is bypassed. When possible, however, the data will be altered and the offending instruction re-executed. In that case, both "old" and "new" data fields are displayed.

Four Rules

Deep/360 applies four rules to alter data:

● Packed fields missing signs are assumed to have positive zones.

● Packed fields containing digits greater than nine have the 8-bit stripped.

● Packed fields with a blank (X'40') in the last byte are changed to positive zero.

● High-order digits of a multiplicand field will be changed to zero as necessary to prevent product overflow during a multiply instruction.

For the first 10 unique core locations at which data exceptions occur, only one message per location will appear: recurring errors in these 10 locations will be counted, but not printed. If errors occur in more than 10 locations, messages for the excess locations will be printed every time errors occur there. After any 10 console messages, the user has the option of sup-

pressing further messages.

To implement the Deep/360 capabilities, the module is called twice, once at the beginning of the program and once as a closing step. The first call sets up the supervisor linkage, and the second call causes end-of-job error statistics to be displayed, including error counts for the first 10 error locations.

Deep/360 is a BAL program that uses the STXIT macro to trap the data exception errors. A relocatable module, it requires approximately 3K bytes of storage.

Deep/360 is said to work with

any DOS release. Macro said that it works with overlays as well as mainline coding.

The installation for Deep/360 includes job stream deck, user's manual and assembly listing, along with object deck. Macro said that the Deep/360 source deck is also available upon user request.

Cost of the package is $225. Multiple installation rates are $450 for two to four sites; $1,000 for five to 10 sites; and $1,500 for an unlimited number of sites.

Macro Services Corp. is at 131 Tremont St.

```
BG // JOB CATALOG DEEP/360 IN RELOCATABLE LIBRARY
   00.02.17
BG EOJ CATALOG
   00.02.38,DURATION 00.00.21
BG // PAUSE HIT EOB TO EXECUTE DEEP/360 TEST PROGRAM
BG
BG // JOB TEST DEEP/360
   00.02.49
BG LOC 002808 OLD 01FF                              NEW 017F
BG LOC 002814 EDIT INSTRUCTION BYPASSED
BG LOC 002874 OLD 002E                              NEW 002C
BG LOC 002874 OLD FFFFFFFFFF                        NEW 77777777F
BG LOC 002874 OLD 777777777F                        NEW 000077777F
BG LOC 00286C OLD 404040                            NEW 00000C
BG LOC 00286C OLD 404040                            NEW 00000C
BG LOC 002822 OLD 500C                              NEW 000C
BG LOC 002828 INVALID OVERLAPPING FIELDS -- INSTRUCTION BYPASSED
BG LOC 00282E INVALID OVERLAPPING FIELDS -- INSTRUCTION BYPASSED
BG LOC 00283A EDIT INSTRUCTION BYPASSED
BG LOC 002840 OLD 4040                              NEW 000C
BG LOC 002846 OLD FFFF                              NEW 777F
BG TYPE IGNORE TO STOP PRINTING OUT ERRORS ELSE EOB
BG Ignore
BG LOCATION   002808    0001    DATA EXCEPTIONS OCCURRED
BG LOCATION   002814    0001    DATA EXCEPTIONS OCCURRED
BG LOCATION   002874    0001    DATA EXCEPTIONS OCCURRED
BG LOCATION   00286C    0001    DATA EXCEPTIONS OCCURRED
BG LOCATION   002822    0001    DATA EXCEPTIONS OCCURRED
BG LOCATION   002828    0001    DATA EXCEPTIONS OCCURRED
BG LOCATION   00282E    0001    DATA EXCEPTIONS OCCURRED
BG LOCATION   00283A    0001    DATA EXCEPTIONS OCCURRED
BG LOCATION   002840    0001    DATA EXCEPTIONS OCCURRED
BG LOCATION   002846    0001    DATA EXCEPTIONS OCCURRED
BG DATA EXCEPTIONS AT MORE THAN 10 LOCATIONS
BG EOJ TEST
   00.06.08,DURATION 00.03.19
BG // PAUSE END OF JOB.  DEEP/360 READY FOR USE
BG
```

Sample console log showing "old" and "new" contents of modified fields, instructions bypassed because data could not be successfully modified, and end-of-job statistics (following "BG ignore" line).

Decus Adds Utility Series for PDP-10; SEG Formed to Provide Systems Support

MAYNARD, Mass. — Users of Digital Equipment Corp. (DEC) equipment can look forward to additional systems support from DEC and an array of software packages for the PDP-10 from the company's computer users' society.

Specifically, DEC has formed a Systems Engineering Group (SEG) to meet the needs of multiprocessor computer systems. SEG is expected to provide systems engineering, documentation, and diagnostic programming for all DEC systems.

Meanwhile, Decus, the user's group, has made available a series of utility programs, a collection of Fortran programs for scientific applications and flowcharting, and a pair of detailed scientific application programs.

Decus said that ARP, a collection of Macro-10 utility programs, provides character and byte manipulation and logic operations on full PDP-10 words. ARP is also said to include conversion from numeric to alphanumeric format and from alphanumeric to numeric format, and a printer output

report generator.

Trace, a program using the ARP utility package, is a batch-oriented object time debugging package designed to serve the same editing function in the batch mode that DEC's Dynamic Debugging Technique (DDT) serves in the time-sharing mode. It is written in Fortran, and is primarily intended to be run with Fortran programs.

The Fortran Scientific Subroutine Package is a collection of I/O-free computational building blocks that can be combined by a user with his own input, output, or computational routines, to meet his requirements. All routines in the package are accessible by Fortran CALL statements and are treated as standard Fortran subroutines. The Fortran Flowchart Program accepts a Fortran program and creates a flowchart from it.

The first of the Scientific Application packages, Nvertx, is a self-contained, easily expandable Monte Carlo program in Fortran Macro-10 for studing interactions in high energy physics. Decus said that the program can

generate events and plot results for a wide class of reactions, including those governed by Lorentz invariant phase space and those exhibiting resonances or other nontrivial matrix elements.

Ecap, an Electronic Circuit Analysis Program, is designed to handle DC, AC, and transient analysis. Ecap is available from Teletype terminals, or from batch, and is a Fortran program.

In addition to the systems engineering, documentation and diagnostic programming to be provided by SEG directly, the group will be able to provide special interfaces and other equipment, through DEC's Customer Special Systems Group, and custom software, from the Applications Software Group.

DEC said that SEG will support the entire product line, including central processors and peripheral gear.

Another new service allows buyers of DEC computers to receive Engineering Change Order Logs for their equipment, so that they can be sure their computers are being maintained at DEC's latest level of manufacturing specifications.

Two Ways

A user can obtain this service in one of two ways — if his equipment is covered by a warranty, or if he has signed a maintenance contract with DEC, the Engineering Change Order Log will be mailed to him and updated at no cost, and the modification to the equipment will be made by DEC field service technicians at no charge.

If the user maintains his own equipment, or if he uses DEC field service on a "per call" basis, he may subscribe to the Engineering Change Order Log for $25 per year.

The software is available from Decus at no cost to members and at minimal cost to non-members, the company said.

Decus is at 146 Main St.

'Editor' Uses RPG-Like Approach To Create Cobol Source Programs

WASHINGTON, D.C. — Univac 1108 and IBM 360 users can now use an RPG-like approach to generate Cobol source programs with the Editor package from Group Operations Inc.

The programs that can be generated by Editor are limited to those that read and edit transactions and use the acceptable input to create and/or maintain data files on tape or disk.

Once generated by Editor, these programs are compiled with a normal Cobol compilation run and can be modified independently of the Editor system.

The inputs to the Editor system are simplified descriptions of: the input transaction file, each data element and its associated edit criteria; the type of output desired; and the specific capabilities of the programs to be generated.

The delivery schedule for the system that works on a 32K 360/30 is 30 days; for a Univac 1108, 60 days. Group Operations offers conversion support during the interim.

Price of the Editor package is $3,800.

Group Operations is at 2025 Eye St., N.W.

CIF Can Cross-Reference Application Files on 360

JENKINTOWN, Pa. — S/360 users having many separate but logically interrelated application files can move to a cross-referenced on-line system by using the Central Information File (CIF) System, available from Computer Systems Technology (Comstec).

The focal point of CIF is the Preliminary Information File which provides ties to the existing application files. Within the Preliminary Information File, the primary file is sequenced by name and contains all static data such as address, mailing instructions, and related semi-permanent information.

The secondary file is an index, sequenced by the various application account numbers. It is used to select the correct customer file when only an account number is known.

Logically, the files can be accessed by name, and/or address, and/or account number, and/or any other three selected fields. Physically, they can be accessed through the console or through IBM 2260 terminals, Comstec said.

The first of two programs within CIF, Inform, permits a user to

read, search, or update any field within a record without being concerned with the organization, location, or format of the file.

The second package, Support, is described as a generalized utility package which can be used to print all reports, punch cards, and type console messages. Comstec said that input for Support can be either sorted or unsorted, fixed or variable length records (from 52 to 155 bytes each), and in blocks up to 1,000 bytes long.

Conversion to CIF is handled by a series of programs that extract the basic reference data from the original application files and generate the primary and secondary files.

Designed by the American Fletcher National Bank, Indianapolis, CIF is written in BAL and has been implemented under DOS/360 using a 360/30 with 65K storage.

CIF can be purchased for $35,000, including extensive documentation and one man-month of on-site system support.

Computer Systems Technology Inc. is in Suite 700-42 at the Fox Pavillion.

AT&T, WU Told to Extend Telpak Rate Benefits to All

WASHINGTON, D.C. — AT&T and Western Union have been ordered by the FCC to "extend the benefits of the Telpak shared rates to all private line customers without regard to the nature of their business." AT&T had previously warned that such a ruling could bring about the end of Telpak service for all users.

The commission decision said, in effect, that regardless of the consequences, the current situation — in which the carriers allow some Telpak customers to share the use and cost of the system, but denied the sharing privilege to other customers — was discriminatory and could not be tolerated.

The Telpak service is an offering of discount rates to high-volume data customers who subscribe to large numbers of private line channels between specific points. The tariff reduces the charge per channel as the number of channels used by the customer increases. Currently under Telpak C and D, the number of channels available to a customer is 60 or 240. Previous offerings under Telpak A and B of 12 and 24 channels were ruled to be competitively unfair by the FCC.

60 Days to File

The carriers now have 60 days in which to file "appropriate" tariff revisions to eliminate the discrimination. The FCC said that the new filing would be subject to rejection if they do not conform to the principles of the decision.

Communications

The FCC sharing ruling affirmed, with certain modifications, the "recommended decision" of the Common Carrier Bureau, prepared in April, 1969. This decision did not say how the Telpak rate discrimination should be eliminated, but two approaches were suggested: discontinuing sharing privileges for all users; or permitting all users to combine their private line requirements to obtain Telpak rate benefits.

AT&T said that if the 1969 recommended decision was affirmed without modification, it would discontinue sharing practices altogether. This would result, AT&T warned, in adverse financial impact on all levels of government, industry and utilities, with increases ranging up to 200% for some local and state agencies that now share Telpak rates.

Plan Vetoed

The commission said that it "cannot permit AT&T to carry out its stated intention" to eliminate all sharing. The FCC also said in the latest ruling that it did not believe such a plan would eliminate the discrimination, since "certain groups of users" would be able to continue to group together to obtain the equivalent of Telpak shared rates through other means.

The effect of AT&T's intention, if carried out, the commission said, would be simply to enlarge the class of persons discriminated against, without adequate justification.

The commission said that it recognized that the current decision may have an adverse impact on the Telpak rates, rate structures, and revenue requirements, but that the "consequences" could be appropriately considered in another, concurrent private-line rate inquiry.

The FCC said that it was important that the revised tariffs be designed so as to permit each user of private line services to have equal access to all other users of the rate benefit existing in Telpak sharing.

Burroughs L3000 Utilizes Micrologic for Accounting

By Christine Frederickson
CW Staff Writer

DETROIT — The newest member of the Burroughs family of compact computers, the L3000 series, uses micrologic like its predecessors and is also an accounting computer.

The Burroughs micrologic, also known as firmware, is an advanced software concept that performs the basic logic and arithmetic functions that are usually handled by hardware.

Five models in the L3000 series are being offered at this time, with variable amounts of memory and differing degrees of I/O and data communications capability for general accounting and management reporting applications. The computers are modular in design.

The L3000 can operate as a billing system or as a terminal computer for on-line, real-time applications. Communications capabilities are offered over leased lines or through hardwired hookup to a computer or Burroughs DC1000 controller. Three modems available for asynchronous mode, duplex transmission operate at up to 1,200 bit/sec.

Programmed Internally

Because the L3000 is programmed internally, processing is handled entirely in electronic memory by micrologic in conjunction with application programs. Micrologic controls I/O peripherals, mathematical functions, and the moving, managing and accumulation of data, the company said.

Programs for the L3000 are written in Cobol and about 15 packages in the general accounting area are being offered.

The system has a console printer with split platen, allowing it to receive or send messages at 20 char/sec.

The L3000 can handle 15-1/2-in. forms that provide applicational flexibility to the user requiring ledger cards or unit set forms. Front-feed forms can be combined with continuous forms, cut journals or roll journals in combinations to suit the application, the company said.

The L3000 series operates with the same peripheral devices as the Burroughs TC500 terminal for input and output of information. The system can handle punched paper tape or edge punched cards and 80-column punched cards.

The 80-column card reader handles 100 card/min. The punched paper tape/edge punched card reader prepares input at 40 char/sec. The punched paper tape/edge punched card perforator has a speed of 40 char/min.

Four models in the series, which range in memory capacity from 128 to 512 words, perform as operator-attended accounting computers while the fifth model can perform both in an operator-attended mode and in an on-line data communication mode.

64-Bit Word

The computer has a 64-bit word, made up of either 16 digits, eight alpha characters, or four instructions.

Application programming for the L3000 series is priced separately from the computer hardware, the company said.

L3000 computers are available for sale or lease. Purchase prices range from $9,490 to $13,290, depending on customer requirements. Lease prices range from $240 to $335 per month. First deliveries of the series are expected in September.

Regitel System Has Mini-Terminal Net To Gather Retail Store Transaction Data

SAN CARLOS, Calif. — An electronic point-of-sale transaction system from American Regitel Corp. comprises a network of electronic cash registers with their own local minicomputer.

The Regitel System, designed to provide edited data to a store's central computer, includes up to 60 registers that are programmed to lead sales people through each step of a retail transaction. The registers compute transaction totals, and taxes automatically and can perform instantaneous credit checks. Because the terminals are controlled by a minicomputer, Regitel said that any type of store transaction can be handled.

High-speed printers, also part of the system, automatically produce descriptive sales slips, shipping labels, merchandise control information and other data needed for store operation, the company said.

A system configuration would include a communication controller, a multiplexer, Regitape, IBM-compatible Data Collection tape unit, associated communication circuits and auxiliary optional equipment such as credit card and Kimball ticket readers, Regifile fixed head disks, additional printers, and Teletype terminals.

The Regitel terminal can be equipped with one or more cash drawers (manufactured by NCR). Input is through a 10-key decimal keyboard and associated control keys. Eight additional functions can be controlled by one set of function keys. A second set of four keys controls the more commonly used operations.

Output is through an alphanumeric printer which prints a 30-column line at 40 char/sec. A 44-character set is provided. A journal tape is prepared at the time of printing, which is automatically spooled. The printer will accept single or multiple ply paper spools 4 in. wide and 4 in. in diameter. A manual release lever that permits insertion of forms, such as sales slips, for overprinting, is provided. Maximum size for such forms is 5 in. wide by 9 in. long.

The prompting display, used for operator guidance, consists of 32 individual displays which can be varied from unit to unit and are tailored to each application. It is used to present to the operator the information and directions necessary to the processing of the sales transaction.

Regitel supplies, as optional equipment, a remote display unit that can be located up to 25 feet from the register, replacing the register display panel.

The terminal has two modes of operation, free-standing and Regitel System. In the free-standing mode the equipment operates as a free-standing cash register and will accept quantity, merchandise number, and price entries. Where a credit card/ticket reader is included, alphanumeric data read from the credit card or ticket is printed. All data necessary for the proper formatting of sales slips, including department number, store name and special messages, are stored in a ROM, which may be varied from unit to unit.

The heart of the Regitel System is the controller which is constructed of two basic components, a minicomputer (Nova) and a Serial Line Multiplexer.

The minicomputer can be equipped with from 4K to 32K 16-bit words of core memory. Basic processor cycle time is 2.6 μsec. The mini is supported by a body of standard software including assemblers and loaders, and is supplemented by special programs for multiplexer control and specialized terminal applications. Other programs are available for control of tape decks, 360/2703 interfaces, multicontroller/applications, and magnetic disk storage.

Eight Tape Decks

Up to eight tape decks can be provided per controller. All tape decks feature vertical and horizontal parity, IBM-compatible check characteristics, plus read-after-write recording. Ten and one half in. reels of 1/2 in. tape can be read at 25 in./sec. Compatible with IBM 2400 series drives, the decks can read 7- or 9-track tape at densities of 200 or 800 bit/in.

The Regifile Disk System is a fixed-head disk rotating at 3,575 rpm with a capacity of .6 million byte/drive. Up to eight drives can be connected to one controller.

A model system, designed to be used by one main and three branch stores, has been specified by Regitel. The main store would be equipped with 30 registers, and the branches would be equipped with five, three, and one register, respectively.

The system includes the following features: tape drive, optional Dial-Up from central EDP, Regifile Noun Table and Negative Credit File, provisions to include an optional card and ticket reader, and expandable to include additional terminals.

The estimated cost of the model system, including communications, is $5,395/mo, including amortized installation costs (36 months). This also includes customer training, maintenance, training and operational aids, and standard programming. Special programming is available at extra cost.

The first Regitel System is currently being installed in Los Angeles. Installation time is approximately eight months, the company said.

American Regitel Corp. is at 1011 Commercial St.

Sycor Terminal Analysis—Part II

Variety of Optional Features Available

By Malcolm L. Stiefel
Special to Computerworld

Sycor supplies a line of optional features that complement the capabilities of the basic terminal, which is virtually useless alone, and create more powerful configurations.

The modifications that may be made to the basic terminal include a second cassette recorder, a host of communications interfaces, and additional logical capability for limited arithmetic calculation — for checking arithmetic inputs, and for sensing omitted fields.

The second recorder comes with a modified microprocessor, which can be installed on site by replacing three plug-in printed circuit boards in back of the terminal.

Sycor will provide the capability to add any specific interfaces to a terminal in the field as long as the move is planned in advance. Otherwise, the basic delivered terminal will not necessarily accommodate a given feature unless it is taken back to the factory.

When the second cassette recorder is added, the associated microprocessor has a pooling capability, so that the operator may select records from the first cassette to be recorded on the second cassette for processing elsewhere.

This option also permits the storage of control programs and formats on the second cassette, for rapid entry into read/write memory.

> Viatron's difficulties in delivery of System 21 and its switch to a purchase-only policy have prompted a search for suitable alternatives. In this series, CW examines the Sycor terminal which comes closest to System 21 in features and also offers users the added capability of interfacing with major manufacturers' computers.

In the basic terminal, programs must be entered manually; alternatively, the program cassette may be taken off the shelf, read into the memory, and removed, to be replaced by the data cassette.

This slow, awkward process is improved somewhat by the addition of the second cassette. The manual program entry procedure must still be carried out, however, if the second cassette is to be used for pooling, so that it isn't free for storing programs.

Communications Options

Sycor's communications options are designed to accommodate existing equipment in the hands of users. Attachments that operate at speeds up to 1,200 baud are built to emulate IBM and Teletype terminals, either attended or unattended, through standard modems. Sycor also provides its own 1,200 baud modem.

At the slow-speed end of the spectrum, a Teletype ASR-33 or ASR-35 emulation interface is available which transmits and receives at 100 baud through a 103A modem.

Next in line is the IBM 1050 emulator which operates at 150 baud through a 103A modem, using PTT code for transmission. The speed then jumps to 1,200 baud, where Sycor offers a communications interface to the common carrier, switched network and a separate interface which emulates the IBM 2770 data communications system. These options use a 202C modem or a Sycor-built modem.

The 2770 emulator uses IBM's binary synchronous communication procedure, so Sycor gives the user a Type II binary synchronous adapter with the emulator option for this mode.

All communications options except the IBM 1050 emulator may be ordered with optional unattended operation features. Sycor also builds a custom-tailored 2770-compatible terminal which can be polled, and it will custom-design other communications interfaces for large customers.

To round out the picture, the line of add-ons includes an accumulator (or two accumulators, if needed) and a check digit capability. The affluent user can also add an omission detection feature, which will lock the keyboard and warn the operator if a prespecified field in a message is left blank or partially filled.

Malcolm L. Stiefel is an independent consultant in the area of systems design. He has had extensive peripheral experience.

Interest Growing in Concept of Multiple Minis for T/S

The idea of constructing a computer system with multiple processors tied together with couplers, central software, and central data storage is becoming more viable with the growth of high-speed, inexpensive minicomputers.

The concept was first applied to the Sage radar warning system where remote computers were constantly feeding pre-processed data into a central memory. This central memory was accessible to all the other elements in the system, and could be used as a data base for analysis and projection by specialized computers within the network.

Minicomputers with large core memory, rapid communications control, high-speed central processors, and developing software are making it possible for individual companies to consider such computer systems for internal use.

The concept of using multiple minicomputers for time-sharing systems is being considered by several minicomputer firms. This concept includes three or more processing units: a small computer to act as a communications controller; and two or more larger machines, one to be used as the central processor, and the other to control large-scale random access storage.

Single Processor

The typical time-sharing system has used a single central processor and several multiplexers and control devices. The multiplexers are used to connect the CPU

Systems/Peripherals

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with the communications terminals. Since these are passive devices, all program control must come from the CPU. In turn, this complicates the operation of the CPU, requiring more complex operating systems, more storage and CPU time to perform the control functions. Buffer areas in memory must also be reserved.

Control units are used to connect the CPU with the system's random access devices. These, too, are passive devices that look to the CPU for control. As in the case of the multiplexers, main memory is required for control program storage and data buffer areas, and CPU time must be used to perform the control functions.

The use of minicomputers in place of the multiplexers and control units does more than merely replace these devices. Because the mini can be programmed, it can handle the control functions. This not only saves the main CPU time but also memory. A smaller main processor could then be specified to do an equal amount of processing.

Several industry observers have predicted that the use of multiple minicomputers would become increasingly widespread in the configuration of time-sharing systems.

The technique was pioneered by Honeywell in its 1648 front-end time-sharing system. The 1648 consists of a 4K DDP 416 used as a communications front-end, and two 32K DDP 516s, one used as a central processor and the other as a job computer. The system has 36 million bytes of disk storage. Honeywell is using the 1648 in its own service bureau activity, but otherwise the system's success has been limited.

In spite of this, interest in the multimini concept seems to be growing. A relatively new company in the industry has recently announced as its first product a time-sharing system configured from one 8K and two 64K minicomputers. This system boasts five million bytes of disk storage on-line.

Data General has recently announced a device that will couple up to 15 Novas and/or Supernovas into a multiple-processor system. The most obvious application is time-sharing systems.

A spokesman for Raytheon said that his company may, in the future, use minicomputers in this way. He added that Raytheon seems to think that disk systems of the capacity of the 2314 can be reasonably used with minicomputers.

Interactive Data Systems has a system that comes close to the multimini configuration, according to a company official. The system, using a Lockheed Mac 16, uses a controller with no memory instead of the third miniprocessor to control up to eight 2314s.

H-P System

A Hewlett Packard spokesman said that the H-P 2000B is his company's multi-processor time-sharing system. The H-P 2000B uses a 2114 mini, attached to 32 terminals, as a front-end for a 2116.

On special orders, Digital Equipment Corp. installs minicomputers in different configurations joined together, DEC said. DEC has switchover hardware for such systems in which more than one computer is tied to a main computer, the company added.

"This type of thing is very possible," was the reaction of a Lockheed electronics official. "However," he said, "there's not a volume (standard) market for this type of product because customer needs are so specific in this area; the customer usually turns to a systems house for something like this."

Terminal Testing System Developed

NEW YORK – The Comsonic Corp. has developed a computer-controlled terminal testing system to meet the quality control needs of terminal manufacturers and "to access the concept of using a computer as a testing tool," according to company senior vice-president, C. DeSimone.

Designated the Comtest-8, the system, as presently configured, can test from two to 16 terminals simultaneously at varying transmission rates and codes, and may also be used for remote diagnostics and demonstrations, according to the company.

The Comtest-8 is based upon the Digital Equipment Corp. PDP-8/I minicomputer, but can be adapted to any small real-time computer with communications capability, the company stated.
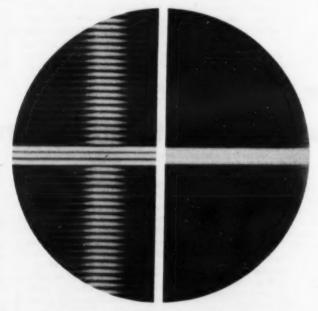
Comsonic claimed that an automatic test system can be justified by manufacturers producing 50 or more units per month.

The Comtest-8 hardware is priced at under $20,000, including basic software. Custom-tailored "software services are available on a turn-key basis to adapt a system to the specific requirements of the user," for additional cost, according to DeSimone.

The delivery schedule is three months. The Comsonic Corp. is located at 132 W. 31st St.

This is IBM's new System/370.

It's designed to give you a lot more computing.

Yet it's compatible with System/360.

Which means you can install System/370 and still keep using most of the same programs your programmers have written. And still keep using the same terminals. And the same instruction set.

Which also means if you're now using System/360, you can easily make the move up to System/370.

More work, less time.

The key idea behind System/370 is speed and throughput. We've speeded up the computing process. And not just a little bit, either.

Compared to System/360's central processing unit, System/370's is 2 to 5 times faster internally.

The result is you get more computing.

Model 155.

On the left, you see System/370 Model 155.

If you're now using Model 40 or 50, it's the natural system to grow to.

Model 155's internal speed is 3½ to 4 times faster than Model 50's.

It also has more channels (6 in all) and the widest range of core storage ever offered by IBM on a medium-sized system. From 256K to 2 million bytes.

Model 165.

If you're now using Model 65 or 75, you can easily grow into Model 165.

Model 165's internal speed is 2 to 5 times Model 65's. It also has more channels (12 in all) and a remarkable range of core storage. From 512K to 3 million bytes.

Both models use a high-speed buffer that dramatically reduces the time it takes to get at stored data.

A file, a file and a printer.

To keep up with speeds like these, we've developed some of the most sophisticated input/output devices to go with the system.

First, there's a new high-speed disk file (the 3330). It can hold up to three and a half times more information (800 million bytes) than our current files. And it can transfer it up to two and a half times faster. This file alone can significantly increase performance.

Then there's a fixed-head, high-speed file (previously available with System/360, Models 85 and 195). It's for people who want fast access to even more data than the large memory can store.

In its own way, it's an inexpensive extension of your computer's memory. It, too, can feed data into your computer at incredible speeds.

Finally, there's a high-speed train printer (the 3211). It prints letters and numbers at the rate of 2000 lines per minute. It's the fastest printer we've ever made.

Easy installation.

We've already told you that with System/370 you don't have to convert most existing programs. Or develop new sets of instructions.

All of which makes System/370 easy to install.

But there's another reason why System/370 is easy to install. We're using monolithic circuit families. You get more computing per cubic foot.

Certain Model 155 configurations actually take up less space than Model 50.

We support the system.

We realize our job isn't only making computers. But also making sure you get the most out of them.

So we intend to make available the best possible services to support System/370.

Our systems engineers are available to help you get ready for System/370.

They can work with your own people to smooth the way for its arrival. And at the same time, tailor the system to solve your particular problems.

Our computer programs for System/370 are, by and large, the same as those we offer for System/360.

The same holds true for our education courses. There are over 70 to choose from.

Our products change.
But our philosophy doesn't.
We want you to get the most out of your computer system.

IBM.

Parker Named DPMA International Head

SEATTLE – James D. Parker Jr., assistant manager, systems and data processing, Texas Eastern Transmission Corp., Shreveport, La., has been elected international president of the Data Processing Management Association (DPMA) at its recent conference and exposition.

Parker, who held the post of executive vice-president this past year, will serve a one-year term.

He succeeds D.H. Warnke, who remains on the DPMA executive committee as immediate past president.

Edward O. Lineback, manager of commercial airplane program computer services for Boeing Co., has been elected international executive vice-president.

Three new international vice-presidents at-large were also elected: Stephen DiStefano, Philadelphia; Eric Ustad, Montreal, and Kenneth Sledd, Richmond, Va. Four others were re-elected: Anthony Long, Cleveland; Herbert Safford, Los Angeles; James Sutton, Birmingham, Ala.; and B.W. Jack Taylor, Dallas.

David B. Johnston Jr., department manager of information systems methods and office services, Western Electric Co., Indianapolis, was re-elected to a fifth term as international secretary-treasurer.

James D. Parker Jr.

IACP DP Film Catalog Available

SYCAMORE, Ill. – The International Association of Computer Programmers (IACP) has recently published a 26-page catalog listing more than 90 films of interest to the DP community. Included are directions for ordering the films, sources, prices, and sample order forms.

IACP chapters throughout the U.S. and Canada will use this publication as an aid in planning their local programs.

Concerns not affiliated with IACP may purchase the catalog for $2 from the Publications Department, IACP, Post Office Box 57, Sycamore, Ill. 60178.

Bright Elected AISC President

GAITHERSBURG, Md. – Herbert Bright, president of Computation Planning, Inc., is the newly elected president of the Association of Independent Software Companies (AISC).

Bright indicated that he hoped to expand AISC membership, establish a headquarters, and secure a full-time executive director to support work toward the association's objectives, which are to promote business in the interests of profit-seeking companies supplying services and software related to electronic information processing.

AISC has taken action in the federal courts to support legal protection for computer software and has also conducted other activities on behalf of the software industry, presenting members' views to other organizations, the government, and the general public.

CDE Examination Program Begun
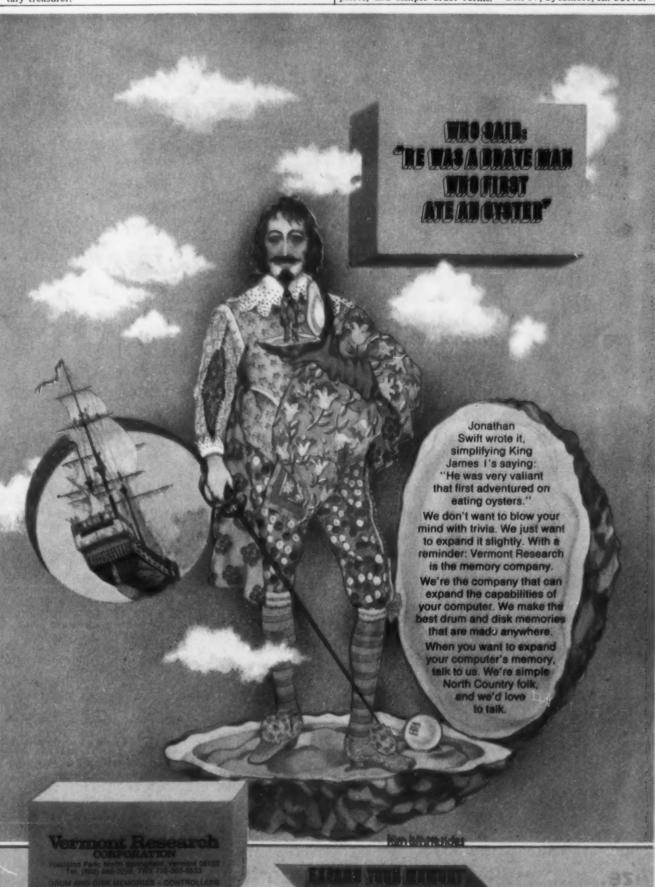
NORTHFIELD, Vt. – The Society of Data Educators has inaugurated the first phase of its Certificate in Data Education (CDE) program.

The CDE will be awarded in several categories, basic and advanced, in recognition of "demonstrated academic proficiency, professional experience, and professional stature." To attain certificates in the various advanced categories to be announced, proficiency must first be demonstrated in basic knowledge of introductory concepts of automation, computing, and data processing (including social and user implications) equivalent to that usually learned in college or university courses in introduction or orientation to data processing. Programming knowledge is not to be stressed in the basic examination.

The first validating examination for the basic will be given free (except for a nominal certificate fee) to any data educator having a knowledge of the content of basic or introductory data processing material gained through teaching experience, course design, textbook authorship, or similar competency. Membership in the Society of Data Educators will not be required.

IBM Historical Review

Exhibit Features 'Information Machines Then and Now'

PHILADELPHIA — An historical review of information handling machines from the 1890s to the present has opened at The Franklin Institute.

The exhibit, entitled "Information Machines Then and Now," is on loan from IBM. The five displays trace the development of information handling machines from early mechanical tabulators to the modern electronic component.

The first unit in the exhibit describes how tabulating machines helped complete the U.S. population census of 1890.

By pressing a button on the display case, the viewer activates a short film which recounts the development of the first series of machines capable of sensing and tabulating information coded into punched cards.

After the film, lights inside the case illuminate one of the original integrator machines invented by Dr. Herman Hollerith for the U.S. Census Bureau.

Versatile Machines

Next, the viewer learns about the more versatile information machines which were developed to keep pace with the growing industrial demands of the period 1900-1920. By 1911, Hollerith's equipment included a machine with a keyboard that punched holes in cards, another to sort cards automatically into selected groups, and a third to add information coded in cards more efficiently.

The film briefly describes how the machines were used by railroads, insurance companies, and manufacturers. At the end of the film, the display illuminates a Hollerith vertical sorting machine.

The third unit of the exhibit explains how business needs for faster operation and more automatic control led to the forerunners of today's high-speed digital computers.

Education

During the 1920s, electrically powered machines were introduced to further increase the speed of information processing. At the end of the third film, the first fully automatic card-controlled electric printing tabulator is shown. Called the Type 1 printer, it was produced by IBM in 1928.

The fourth unit illustrates the progress of information handling in the 1940s with a model of the automatic sequence controlled calculator — the Mark I.

The Mark I, an electromechanical device, followed a set of programmed instructions and printed results of its calculations without further human guidance. The machine, which could perform three additions per second, was a forerunner of modern electronic computing equipment.

Using high-speed microminiaturized circuits like those shown in the final unit of the exhibit, computers today can do well over a million additions per second, with the largest machines able to complete up to 15 million or more per second.

While computing speeds have increased, the cost of computing has dramatically decreased. The cost of processing a computer instruction has dropped one hundred-fold in the past two decades.

"Information Machines Then and Now" was designed for IBM by Woods and Ramierez of New York City.

Among the units on display are an automatic card-controlled printing tabulator of the 1920s, left, and the Mark I automatic sequence controlled calculator, right, a 1944 forerunner of today's high-speed electronic computers.

Personalized Report Cards Put Teachers on the Spot

By Thomas J. Morton
CW Midwest Bureau

EVANSTON, Ill. — The parental furor over computer error versus human error should be a bit louder than usual this year in the local school system, according to Evanston Attorney Leonard Rose.

Rose claims that the new report card system is illegible in that a parent can't tell how his child is doing in school because the parent can't read the "gobbledegook" a computer has generated.

Does What It's Told

Dr. Ronald Thompson, director of data processing for the school system, did admit that a letter from a fifth grade teacher went out with some misspellings and grammatical errors, but added: "You can't blame the machine for that. It can't read or write. It just prints what you tell it to."

"Our reporting system isn't 'computerized,'" Thompson said, "It's 'personalized' by a computer." The Evanston school employs a personal report system sent out to parents on their children's scholastic progress.

Each teacher was requested to file some "sayings and expressions" with data processing relevant to the attitudes, behavior patterns, and learning skills of children in school. The teachers were requested to file these in their own language styles.

When the report cards, or in this case, the letters reporting a given child's progress to his parents, are sent out, all the teacher has to do to obtain this personalized letter is to dial the computer center on any Touch-Tone telephone.

Dial-a-Saying

At connection, a teacher "dials" the number for the particular student. The number for the course or curriculum under discussion, and the number of the

teacher's own "saying and expressions" that best demonstrates that child's progress, attitude, and behavior.

The IBM 1401 prints out a letter to the parents, which specifically concerns their particular child and his progress in school.

"It is so much better," Thompson said, "than having a parent just find out his child received an 'A' in reading or an '83' in arithmetic. With our system the parent receives: 'Johnny is doing fairly well in reading, but he does seem to be having trouble with words of more than two syllables. I would suggest that you encourage him to read the newspaper this summer, helping him on multisyllable words.'"

Expressions Cataloged

The phrases and expressions are published in a catalog, Thompson explained, so that the teachers have them all at ready reference. The letter that generated all the furor, according to Thompson, was

a letter from a fifth grade teacher that had attitude and behavior abbreviated to "att" and "behv."

"Rose," Thompson stated, "took it upon himself to criticize the whole reporting system because he received a letter with the abbreviations and with 'perseverance' misspelled.

"But that's the way our data processing center received it from the teacher. Our keypunch people aren't going to change a teacher's words. Perseverance? That might have been a keypunch error. But these letters go to the teachers for signature. You'd think a teacher would read them over."

The furor could have been an offshoot of political infighting going on in the school district for some months. The former superintendent of schools, Dr. James Coffin, had instituted some new techniques, policies, and racial balance mandates that were greeted by mixed and heated emotions in Evanston. Asked if the complaints from Rose were part of that past unrest, Thompson would make no comment.

Can scientists bring this machine back to life?

W. German Educators Submit Plan for B.S. In Computer Science

By M.W. Martin
Special to Computerworld

BONN, West Germany — The Standing Conference of Ministers of Education in the Federal Republic, the West German Rectors' Conference, the Association for Applied Mathematics and Mechanics, and the Society for Communication Theory have worked out a joint plan for the expansion of the new subject of computer science.

They have submitted a plan for a course of study in the subject, ending with an examination for a Bachelor of Computer Science degree, called "Diplom-Informatiker." Professorships in this subject have already been instituted at several technical universities in the Federal Republic.

Scholarship

The German Academic Exchange Services offers a number of study scholarships abroad for the advancement of computer science. These will give computer scientists and other scientists and holders of B.S. degrees in mathematics, physics, or engineering an opportunity to carry out research and study projects or to pursue intermediate courses in the U.S., Canada, or the UK.

Nasa Awards Fellowships, Finances Maryland Institute

GREENBELT, Md. — Twelve black college students will study programming and draw $100-a-week fellowships this summer at the Goddard Space Flight Center in Greenbelt, Md.

The special institute, financed by a $20,590 grant from the National Aeronautics and Space Administration, is being directed by Peggy Jean Bannister, a chemistry professor at Bowie State College (Md.). Mathematicians at Goddard will do the teaching.

Among the colleges sending students are Bowie State, Howard, D.C. Teachers College, Federal City College, and Maryland State College.

Engineering College Adds CS

NEWARK, N.J. — Newark College of Engineering is expanding its curriculum to include courses in a computer science major for evening students. Until now the computer major has been restricted to day students. Course work includes advanced programming, computer organization, and system simulation.

370 Series on the Line

The IBM 370/155, one of two models of the new high-performance system, is being built at IBM's Poughkeepsie, N.Y., plant. The computers are assembled and tested in "bays," three of which are seen here. The IBM engineering and production technicians in the foreground are running a set of computer programs which allows them to check the performance of each element in the central processing unit. The 370's central processor's arithmetic and logic circuits operate at speeds measured in billionths of a second.

Computer Consulting Company Ends Certain Military Contracts

By Judy Dick
CW Staff Writer

CAMBRIDGE, Mass. — "We will not accept work directly related to the development of weapons systems. We adopted this arbitrary line for the simple reason that we do not like creating systems that will kill human beings," declared Victor Oppenheimer, president of Cambridge Computer Associates (CCA).

CCA is apparently the first computer company to take official stand against certain military contracts.

But CCA has not decided against all military systems. Oppenheimer noted that "you must draw a line somewhere," but he conceded that such a line is necessarily arbitrary.

For Oppenheimer and CCA, the line separates systems which are "obviously bad," such as weapons, and those which can be used for either "good or evil." The technician has the right to refuse work on the obviously "bad" projects, Oppenheimer explained, but it is improper for the technician, on his own, to decide against developing systems which might benefit mankind.

Not everyone draws the line in the same place, however, so CCA allows employees to refuse to work on projects they consider objectionable. Several employees have done so, Oppenheimer said.

Oppenheimer explained that his stand aginst weapons work was not intended as a political act or a protest against the Indochina War. "It resulted simply from our not wanting to be involved in killing our fellows," he declared.

Opposite of IBM

CCA's stand is in strong opposition to that taken by IBM. IBM Chairman Thomas J. Watson Jr. has spoken out strongly against the Indochina War, but he has also declared that as a corporation, IBM must support the government and continue to perform all military work [CW, June 24, May 6].

CCA is a consulting firm of 56 people providing systems analysis, documentation, and programming services. Oppenheimer is also the new chairman of the Greater Boston Chapter of the Association for Computing Machinery (ACM).

No Contracts Refused

CCA's decision primarily represents a change in marketing policy, in which the company will no longer bid on weapons systems. Since it does not bid on objectionable projects, CCA has not had to refuse any contracts, and does not expect to be offered contracts that it would have to refuse.

Although he conceded that "funds are more fluid in direct military projects," Oppenheimer also noted that "the fact that we choose not to direct our efforts to the military market is not necessarily a bad thing from a business point of view."

The policy of not doing certain military work does not extend to the sale of proprietary software packages, according to company sources. One package was sold to the Central Intelligence Agency (CIA), even though the company decided not to bid on CIA consulting contracts, the sources said.

In drawing its "arbitrary line," CCA has accepted at least two military contracts, including a subcontract for Project Cambridge.

Cambridge: Good or Evil?

Project Cambridge is a controversial $7.69 million Defense Department-funded project to develop computer techniques in social and behavioral sciences [CW, Oct. 22]. Critics have charged that it will allow military planners to manipulate people in underdeveloped countries and would encourage the government to participate in future foreign wars.

Oppenheimer agreed that the methodology being developed under the project could be used for evil, but he also noted that "as society evolves, new problems arise which require new methodologies such as this for solution and control. The current threat of nuclear holocaust is only one example of a complicated international problem whose eventual solution will demand all of the resources which technology can provide."

Since the methodology being developed under Project Cambridge could help to solve such a complicated problem, Oppenheimer does not feel that the technicians alone have the right to "squash it just because it could also be used for evil."

52 Association Awards Perot Medal of Honor

NEW YORK — H. Ross Perot, president and chairman of Electronic Data Systems Corp., Dallas, has been awarded the 1970 52 Association's 1970 Medal of Honor.

The 52 Association Inc. is a non-profit, philanthropic organization, dedicated since 1945 to serving the needs of America's wounded and disabled. Since January, 1969, 52 has been engaged in a nationwide, in-hospital training and placement program in the EDP field (Operation Computrain) for wounded servicemen.

'United We Stand'

Perot was selected for creating a more cohesive unity amongst Americans by establishing "United We Stand," and for his strong endeavors towards gaining the release of American prisoners of war in Vietnam.

H-P Work Reduction To Hit 11,000 in U.S.

PALO ALTO, Calif. — Hewlett-Packard Co. has ordered most of its U.S. employees to take a day off every two weeks to achieve a 10% reduction in work schedules. Some 11,000 employees, most of whom work in H-P plants in California, Colorado, Massachusetts and New Jersey, will be affected.

President William R. Hewlett said that pay, including the salaries of all corporate officers, will be reduced accordingly.

"The work reduction will enable us to keep our inventory position more in line with current business forecasts," Hewlett said. "The marked slowdown in the U.S. economy and its adverse effect on our domestic business has made this step necessary.

"We consider the work reduction a more effective and equitable method of reducing costs and inventory than by laying people off."

Hewlett said the work reduction will continue "until business conditions warrant a return to full production. In the meantime all company facilities, including sales offices and service centers, will remain open the full work week to serve our customers."

Hewlett Packard's total employment is 16,500, of which about 3,400 are employed overseas.

"Since our international business is reasonably good, we are not planning any work reduction in our overseas plants," Hewlett said.

For the six-month period ended April 30, H-P reported a 15% gain in sales over the corresponding period of 1969, and a 6% gain in incoming orders. In the U.S., however, orders were down 6% from a year ago.

UCC's Kearns Cites Rise In DP Maintenance Need

DALLAS — "The requirement for computer equipment maintenance across the country has created demands that exceed the capabilities of practically every maintenance firm in existence today," declared Edward F. Kearns, president of University Computing Co.'s System Support Division (SSD).

UCC is establishing site-and depot-level spare parts inventories to serve its 10 SSD service centers and more than 100 service points nationwide.

Kearns felt three primary requisites are necessary to meet the maintenance needs of computing equipment users: financial strength, hardware independence, and a qualified managerial and technical staff.

UCC utilized this formula, he noted, in recently forming its Los Angeles-based System Support Division, which specializes in nationwide maintenance, including IBM's 360 and mixed configurations.

Completely Objective

"Since the UCC maintenance organization is not motivated by the sale of hardware," Kearns explained, "the user is assured of a completely objective approach to his service needs, regardless of the various makes of equipment within his facility."

Kearns estimated that the maintenance market alone is worth some $230 million annually, and he believes that independents such as the SSD can capture the majority of this market.

"There is no reason today to have a manufacturer maintain equipment." Kearns adds. "Maintenance is not complicated. Good people, good control and a responsive and well-funded organization will enable the computer user to obtain service better than that delivered by a manufacturer."

CEI Expects New IBM Series to Aid Used Computer Marketing Industry

NEW YORK — The announcement of two new computers by IBM should materially benefit the used computer marketing industry, according to Morton Wimpie, vice-president, The Computer Exchange, Inc., a large company in this field.

He said CEI anticipates deliveries of the new 370 series in 1971 and the firm will increase the supply of 360 systems for resale. Because the new system apparently is an extension rather than a breakthrough in computer technology, he said, prospective used computer customers can satisfy their performance requirements on a 360 system.

Wimpie said IBM stressed improved cost/performance ratio as a primary advantage of the new 370 system. "This may be true when comparing costs on a new equipment basis," he said, "but it must be remembered that our customers for used 360 systems buy at prices from 20% to 35% below net costs."

Transportation Contract

Time-Sharing Enterprises Inc., King of Prussia, Pa., has been awarded a contract to provide technical assistance to the Department of Transportation in evaluation of remote computer T/S services.

IBM to Use Canada Grant To Build Plant in Quebec

WINNIPEG – IBM Canada Ltd. will start immediate construction of a $21 million plant in Bromont, Quebec. The plant will product microelectric circuit components to be used in IBM computers.

Such components have previously been manufactured in the U.S.

The company has also received a $6 million grant from the Federal Department of Regional Economic Expansion for the construction of the plant. This is the largest incentive grant paid to date under the government's Regional Development Incentives Act.

When in full operation, the plant is expected to employ between 650 to 700 people. The development grant will be 15% of the capital cost plus $4,000 per job created in the plant.

Trade Shorts

National Cash Register Co. has changed the name of its Electronics Division to the Data Processing Division. The change reflects "a more accurate description of the activities carried out at the division's facilities in Hawthorne, Calif., and San Diego, and reflects more clearly the scope of its activities in the total NCR organization."

Optimum Systems Inc., a privately owned DP and computer systems concern, has signed an agreement with IBM to lease 12 new computers at an annual cost of $15 million. Optimum Systems said it will lease six 370/165s and six 370/155s. Deliveries are expected to begin "in early 1971 and continue over the following three years," it said.

GRI Computer Corp., Newton, Mass., has signed a provisional licensing agreement with Synlec S.A. of France which will permit Synlec to market the GRI-909 computer, including a full range of options in France.

Basf Systems Inc., Bedford, Mass., has formed a peripheral systems department to distribute and market disk drives designed by Century Data Systems Inc., Anaheim, Calif., in the U.S. and Canada.

Scientific Data Systems, the London-based computer marketing operation, has been renamed Rank Xerox Data Systems, and will operate as a division of Rank Xerox Limited.

Electronic Associates Inc., West Long Branch, N.J., has acquired rights under the technical information, patents, and trademarks of Scientific Control Corp., Dallas, to manufacture and market a remote batch terminal developed by SCC.

Marshall Data Systems, a division of Marshall Industries, has opened new Texas regional offices at 3817 Richmond Ave., Houston, to serve the peripheral products market.

Western Union Telegraph Co. has opened a National Processing Center in North Dallas for accounting and payroll functions.

Data Documents, Inc. has opened a new plant in Dallas. The plant will manufacture continuous forms, tabulating cards, and pressure sensitive labels. The Dallas location is the 15th plant owned by Data Documents.

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Orders and Installations

A computer-controlled high density microfilm display system from Microform Data Systems, Inc. of Menlo Park, Calif., will be installed at the Pacific Telephone & Telegraph Co. (PT&T). Microform has received a contract for an initial installation of its Mindex/380 display terminal at a PT&T office in Van Nuys, Calif. These terminals will operate under computer control to display listings from a confidential, internally used telephone number-customer list.

Kommun-Data AB, Stockholm, a data center service serving local communities throughout Sweden, has ordered two Univac 1106s valued at $4 million. The computers will be used for billing of electricity, water, garbage collection, and rents ss well as for performing a number of other accounting functions. The

Denver School District No. 1 in Colorado has leased a 1106 to be used to serve a variety of instructional, administrative, and business applications serving all schools within its administration.

The Public Service Board of So. Australia has ordered a Control Data 3500 system valued at $1 million to expand its commercial and technical data processing services for a variety of state departments.

Devonshire Computer Corp., Newton, Mass., has delivered its first computer system to **Telefile Computer Corp., Newton.** Telefile is using the Devonshire communications processor as one of three computers which make up its management information system.

Delta Data Systems received an order from Information Sciences, Inc., for its integrated accounting and business management system. Delta also received an order for its proprietary integrated accounting and business management system from Computer Services Center, Inc.

The Dow Chemical Co. of Midland, Mich., and General Mills, Inc. of Minneapolis have each ordered a Burroughs B6500.

KeyProcessing Systems have been ordered by the British Aircraft Corp. and the Performing Right Society from Computer Machinery Co., Ltd. The British Aircraft Corp. has ordered a

25-keystation system to replace 30 keypunches and verifiers.

Ampex Corp. has delivered $225,000 worth of Model TM-1624 digital tape drives to Potomac Electric Power Co., Washington D.C., for on-line operation with IBM 360/40 and 360/50 computers.

Five retailing firms have installed NCR Century series computers. Included are: Beall Brothers, Jacksonville, Texas; Fox-Stanley Photos, San Antonio, Texas; Exotic Gardens, Miami, Fla.; Brockton Public Markets, Brockton, Mass.; and Central Carolina Farmers' Co-op, Durham, N.C. Applications include payroll, accounts payable, accounts receivable, inventory control, and sales analysis.

Buy Sell Swap

CW's Overseas Wrapup

Special to Computerworld

International Computers. Ltd. (ICL) has disclosed for the first 28 weeks of 1970 a profit before tax of $9.1 million compared to $7.25 million for the same period in 1969. While further profit improvement is forecast it does not seem likely that the final total dividend will exceed the 2/3 cent paid last year.

The contribution by the government to development expenditure has dropped by $1.2 million, and $2.29 million payment has been made to the NRDC, and $705,000 interest on the ICL convertible loan have all had to be paid for the first time.

Sales growth was 13% in the first half of the year, far less than last year.

* * *

Leasco Chairman Saul Steinburg agreed in London early this month that his company is now an insurance business looking for a computer direction it has not found. Nonetheless he expects the profits of **Leasco Data Processing Equipment**, the European operation, to be over $3 million this year and $5 million next year.

While leasing in the U.S. has been cut back to virtually nothing, he expects to take on $50 million worth of European business this year compared to $30 million last year. Despite shorter depreciation periods in Europe, said Steinburg, he could still get a higher return in Europe than the U.S.

* * *

The **Diebold**-owned **Gemini Computer Systems** will own 40% of a new Dutch software company, **Pandata**, which has been formed in conjunction with several Dutch organizations. These include the government-owned Post, Telephone and Telegraph Authority, Nationale-Nederlanden – the country's largest insurance company – and the Akzo group. .

The company will have its headquarters in Utrecht and will provide software services for the Dutch PTT, the government and industrial users. Some of the staff of Gemini, which has a professional staff of 250, will be transferred to the new company.

* * *

A share trading system called **Internatonal Stocks and Bonds Electronic Linkage (Isabel)**, will be introduced by **Fourth Market Systems**, a Luxembourg holding company in Copenhagen. It will run on a Siemens 4004/45 computer installed there using the Siemens DC 100 terminal.

The aim is to enable institutional investors who deal in large blocks of shares to operate without the intercession of a broker or jobber.

Electronic Memories Says Share Will Earn 11 Cents in 2d Quarter

LOS ANGELES – Electronic Memories and Magnetics Chairman Trude C. Taylor has predicted that his company will report earnings for the quarter ended June 27 of about 11 cents per share, down from 26 cents for the same period last year.

This means that the first-half earnings will be about 21 cents per share against 46 cents last year.

In view of the anticipated second quarter reduction, 1970 earnings are expected to be less than the 93 cents per share reported in 1969.

Total order input during the first half was well ahead of 1969 and the company's backlog now stands at $55 million compared with $37 million a year earlier.

Taylor stated that second quarter results will not meet management's earlier objectives due primarily to softness of the economy and government procurement stretch-outs.

The lower demand experienced in the first quarter for consumer magnetic products, military and industrial electronic products continued through the second quarter. Earnings recovery in the disk pack operation did not materialize during the second quarter because of reduction in demand and price erosion, Taylor noted.

Earnings of Electroglas, acquired on a pooling basis in May, 1970, were below 1969 because of the present lower growth rate in the semiconductor industry. The company's printed circuit board facility has not achieved the recovery anticipated, Taylor revealed.

In addition, Taylor said demand continues strong for industrial magnets, magnetic products and core memory products. However, some softening in the computer industry has been experienced during the second quarter and may continue for some months before normal rates of growth are resumed.

Corporation S Reports Net Loss for Six Months

DALLAS – Corporation S, Recognition Equipment's service center subsidiary, has reported financial results for the first six months of fiscal 1970, ended April 30. Net loss was $1,428,000, compared with a net loss of $226,000 for the comparative period of fiscal 1969.

A total of 18 Optimation Centers was established in the U.S., Canada, and Europe during the last half of fiscal 1969 and the first half of fiscal 1970.

Merle J. Volding, acting chief executive officer of Corporation S, said that most of these centers are now making progress towards profitability and that several are expected to be operating profitably by the end of the fiscal year. Due to the current economic situation, the company has deferred the establishment of some additional Optimation Centers planned for 1970.

He said the company's objective is for all existing Optimation Centers to be operating profitably before the end of fiscal 1971, and for Corporation S to report a profit for that year.

In view of this change in plans, the company's requirements for capital equipment funds have been sharply reduced. A $6-million loan agreement, of which none had been borrowed and on which the company was paying a commitment fee, has been cancelled. Corporate operating expenses also have been reduced substantially. Plans are being developed to fulfill future financial requirements.

Volding also said that Warren Prince has been named president of Corporation S, effective July 15, filling a post left vacant since the beginning of the fiscal year. Prince has been president of another computer services company and, before that, spent nine years with the computer division of GE.

Computest Sees Higher Earnings, Sales

PHILADELPHIA – Computest Corp. of Cherry Hill, N.J., expects slightly higher sales and earnings for the year ended May 31, 1970, than previously estimated, President Richard O. Endres told securities analysts meeting here.

Earnings will be slightly above previously estimated 90 cents per share; sales will be approximately $11,600,000. This would compare with last year's earnings per share of 53 cents on sales of $7,743,824.

Computest's foreign business constitutes approximately 40% of the company's total sales during the past year and is expected to play a large part in the company's 1971 business.

Memory will continue to be the fastest growing segment of the computer field, Endres said. Memory bit-use has grown steadily over the years at the rate of 40% per year and is expected to continue. Computer mainframe sales, he said, should continue to grow at the rate of 10% to 15% per year in the foreseeable future.

Endres said that he expects that semiconductor memory applications will enjoy substantial growth in small computers and computer peripherals. He also anticipated that semiconductor memory would grow in a supplementary role in large computer applications such as IBM's new 370 line.

In answer to a question, Endres said that traditional ferrite core memory also had substantial growth ahead of it in the 1970s.

Logicon Reports Record Earnings, Contract Revenues Increase 42%

LOS ANGELES – Logicon, Inc. has reported record earnings for its fiscal year ended March 31, 1970. Contract revenues increased 42% to $7,138,657 compared with $5,036,905 the year before.

Net income was up 34%, reaching $318,888 compared with net income of $238,757 in fiscal 1969. Earnings per share for fiscal 1970 were 40 cents, representing a 21% increase over the 33 cents reported a year earlier.

J.R. Woodhull, president and chief executive officer, said: "The past year has indeed been a difficult one for many companies in the computer business and the economy in general. We are in a period of very high interest rates, tight money and cuts in defense spending.

"In spite of these factors I am proud to report that Logicon continues to prosper and the outlook for next year is indeed promising."

Advanced Systems Earnings

CHICAGO – Advanced Systems, Inc., a Chicago-based producer of training programs for commercial and governmental users of computer systems, earned $212,098 or 34 cents a share in the year ended March 31, the company's first complete fiscal year.

USI Seeks Aid Before Liquidation Filing

Special to Computerworld

ROCKVILLE, Md. – The domino effect has hit a small computer manufacturer here, Universal Systems, Inc. (USI).

The company is expected to file for liquidation unless some last-minute financing becomes available, according to Ralph W. Notto, president of the two-and-a-half-year-old firm.

USI's troubles began, he said, last year, when Scientific Control Corp. (SCC) of Dallas filed under Chapter 11 of the National Bankruptcy Act so that it could reorganize. SCC earlier had contracted to supply 40 special-purpose computers to USI to be used as part of the Rockville company's Network Control Processors (NCP) system.

"SCC's filing really hurt us," Notto said. "we had sales orders we couldn't deliver, and some of the systems they did ship to use never performed to specifications." As a result, he added, USI posted substantial losses last year.

USI also made another system, Cosma, to computerize rate pricing and billing for trucking firms, using a Xerox Data Systems Sigma 5 as the heart of the configuration. Notto said there was no problem with this machine.

The Rockville company has been negotiating a reorganization with Resource Management Corp. of Bethesda, Md. and Pentair Industries Inc. of Minneapolis, but the talks have been fruitless.

Transamerica Computer Agrees On Purchase of Remcom 2780 Line

DALLAS – Transamerica Computer Co., Inc. of San Francisco and Remcom Systems, Inc. have agreed to make up to $5 million available for purchase of Remcom's 2780 line of remote batch terminals for subsequent lease to Remcom's customers.

Fraser G. Wallace, chief operating officer of Transamerica, and Wallace D. Potter, president of Remcom, said the agreement extends through Dec. 31, 1971.

As part of the transaction, Remcom will issue to Transamerica Computer Co. warrants to purchase 125,000 shares of Remcom stock at $7.50 per share over a five-year period. The agreement is subject to authorization of these shares by the California Department of Corporations.

Remcom went into full production of the 2780, its remote batch terminal that complements the IBM 360 series, in March and is now in volume production.

Wiltek Shows Quarter Profit

WILTON, Conn. – Wiltek, Inc., manufacturer of data communications equipment, has reported that sales for the six-month period ending April 30 amounted to $864,900, a 42% rise over the same period last year.

Though a loss of $20,600 was registered for the six-month period, the report points out a decided change between the first and second quarter.

Following first quarter sale of $312,000 and loss of $70,000, second quarter sales totaled $553,000, with a profit of approximately $50,000.

DiComes on Stocks

A Way to Rate Computer Stock

If ever a stock analyst wanted to stick his neck out, he would reserve the spirit of his convictions to a judgment one year later. Let the record speak and let the facts of history prove him right or wrong. So are we now involved with history. Will the stock prices which we have dared to predict prove us right one year from now?. We have been seemingly remiss in our strong belief in such issues as Burroughs, Wang, Digital Equipment, et al. But still, naively, let us work for a one-year record and report!

Unfortunately, our prohibition from judging us and our opinions was not taken or perhaps not read. We definitely indicated that, lacking specific recent information and/or news items of moment, our decisions would be predicated purely upon chart action of each stock that we rated. Many researchers call this type of chart reading a form of volatility rating.

In other words, if the Dow Jones Averages' stocks move on the equivalent of one point and a computer stock moves on the same equivalent, volatility is considered reasonable; however, if a computer stock moves twice or more times volatility wise,

Robert DiComes is a retired broker who spends his time managing his stock and real estate portfolios, and a farm in New Hampshire.

then other considerations should be found before rating this stock. This, alone, then has been our dictum for rating the stocks we follow.

No Favoritism

Lacking other pertinent information, we must rate computer stocks as we would any other stock! I am not offering the above ideas as balm for hurt feelings, for I believe this not necessary. I am more than grateful for any material and information which various companies may wish to send me and wish that more would find this possible to do!

But now the new drama takes place in the computer industry. Like new models from Detroit each year, computers now vie for popularity. With manufacturers like IBM, NCR, Burroughs, and others working for acceptance of their new models, the news that Fairchild Camera and Texas Instruments are entering the minicomputer field produces an aura of competition very similar to that of Detroit.

Competition
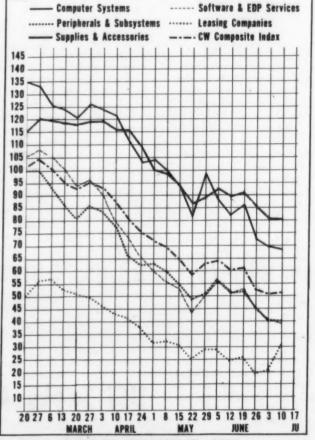
Recent price action in our favorites reflects some of this competition already. Burroughs dips when IBM announces; IBM reacts when GE and Honeywell reveal secret plans. Still, the basic qualities remain the same. With unemployment less in June than recent months and with a probable small upturn in the third quarter, we still hope that the stocks we are betting on will survive the panic of weak stockholders.

Readers ask us how we rate certain stocks selling at this and that multiple. Very simply, I am not as yet convinced that any of our stocks have created a basic multiple which can be considered a rule of thumb; therefore, until this day arrives, my decisions stand!

Most Active

Again, 30% of the most active stocks in the New York Stock Exchange's list were computer stocks. Some were up and some down. Let's go from there. Out and out buys at present levels are: Burroughs, Foxboro, Digital Equipment (or American Research and Development), IBM, Memorex, GE, Sperry Rand, Wang Labs, Potter Instruments, Telex, Control Data, Hewlett Packard, and, really, any other company with a good product mix!

Above stocks listed as Buys comprise issues carried in my model portfolio which now stands at about 60% of its cost on March 23. So be it. But, again, let us rate our performance one year from then!

Computer Stocks Trading Index

- —— Computer Systems
- ········ Peripherals & Subsystems
- —— Supplies & Accessories
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BASE FOR EACH TRADING INDEX: 100 as of 3/1/68

Computerworld Stock Trading Summary

NEW YORK AND AMERICAN STOCK EXCHANGE CLOSING PRICES, FRIDAY, JULY 10; OVER THE COUNTER AND NATIONAL STOCK EXCHANGE, THURSDAY, JULY 9

SUPPLIES & ACCESSORIES

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK PERCENT CHANGE
N	15- 8	9	ADAMS-MILLIS CORP	- 1/4	- 2.70
O	21- 11	12	BALTIMORE BUS FORM	---	----
A	25- 6	7 1/2	BARRY WRIGHT	+ 1/2	+ 7.14
A	35- 15	16 1/8	DATA DOCUMENTS	+ 5/8	+ 4.03
N	19- 11	11 7/8	ENNIS BUS. FORMS	- 5/8	- 5.00
O	17- 8	9	GRAPHIC CONTROLSCORP	---	----
N	166- 53	60 5/8	MEMOREX	-/2 1/8	- 3.39
N	114- 71	74 3/4	3M COMPANY	+ 1	+ 1.36
O	38- 27	28 1/2	MOORE BUS FORMS	- 1	- 3.39
N	43- 21	24	NASHUA CORP.	+ 1/2	+ 2.13
O	48- 25	25 1/2	REYNOLDS & REYNOLD	- 1/2	- 1.92
O	30- 20	20 3/4	STANDARD REGISTER	- 1/4	- 1.19
N	39- 22	22 1/4	UARCO	- 1 3/4	- 7.29
A	30- 8	9 1/8	WABASH MAGNETICS	- 1/8	- 1.35
O	41- 25	29	WALLACE BUS FORMS	- 1/4	- 0.85

COMPUTER SYSTEMS

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK PERCENT CHANGE
N	172- 78	89 1/4	BURROUGHS CORP	+ 1 1/2	+ 1.71
N	37- 9	12 1/8	COLLINS RADIO	+ 1 1/8	+ 10.23
N	122- 30	33 7/8	CONTROL DATA CORP	+ 3/4	+ 2.26
A	124- 50	53 1/4	DIGITAL EQUIPMENT	- 1 7/8	- 3.40
N	11- 3	4 1/8	ELECTRONIC ASSOC.	- 1/4	- 5.71
A	14- 3	4 1/8	ELECTRONIC ENGINEER.	- 1/4	- 5.71
N	39- 18	18 1/2	FOXBORO	- 1 1/2	- 7.50
O	42- 9	9 1/2	GENERAL AUTOMATION	---	----
N	77- 60	71 5/8	GENERAL ELECTRIC	+ 3 1/8	+ 4.56
N	45- 20	23 1/4	HEWLETT-PACKARD CO	+ 2 1/2	+ 12.05
N	152- 65	69 1/2	HONEYWELL INC	+ 1/4	+ 0.36
N	387-237	250 1/4	IBM	- 1/2	- 0.20
N	86- 35	38 3/8	NCR	- 3/8	- 0.97
N	34- 18	19	RCA	- 1	- 5.00
N	33- 16	19 3/4	RAYTHEON CO	- 1/4	- 1.25
O	8- 1	7	SCI. CONTROL CORP.	- 1/2	- 20.00
N	40- 24	26 1/4	SPERRY RAND	+ 1/2	+ 1.94
A	49- 10	12 1/4	SYSTEMS ENG. LABS	+ 1/4	+ 2.08
N	29- 9	10 3/4	VARIAN ASSOCIATES	---	----
A	51- 18	22	WANG LABS.	+ 1 3/8	+ 6.67
N	115- 70	75 1/8	XEROX CORP	+ 2 1/2	+ 3.44

LEASING COMPANIES

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK PERCENT CHANGE
O	9- 4	4 5/8	BANISTER CONTIN	---	----
O	25- 9	9 3/4	BOOTHE COMPUTER	- 1 1/4	- 11.36
O	8- 3	3 1/2	BRESNAHAN COMP.	- 1/2	- 12.50
O	8- 2	4 1/2	COMPUTER EXCHANGE	- 1/4	- 5.26
O	18- 4	---	COMPUTER LEASING	---	----
O	15- 2	---	CYBER-TRONICS	---	----
N	37- 6	9	DATA PROC. F & G	- 1/4	- 2.70
O	8- 2	3	DATRONIC RENTAL	---	----
A	24- 10	12 1/2	DEARBORN COMPUTER	+ 1/4	+ 2.04
O	8- 2	2 7/8	DIEBOLD COMP. LEAS.	- 1/4	- 8.00
A	10- 3	4 1/4	DPA. INC.	+ 1/4	+ 6.25
A	22- 7	10 3/4	GRANITE MGT	+ 1 3/4	+ 19.44
O	44- 5	6 1/4	GREYHOUND COMPUTER	---	----
N	30- 7	8 3/8	LEASCO DATA PROC.	+ .1/4	+ 3.08
O	5- 2	3	LECTRO COMP LEAS	---	----
A	19- 3	---	LEVIN-TOWNSEND CMP	---	----
O	3- 1	1 3/8	LMC DATA. INC.	- 1/8	- 8.33
O	4- 1	1 1/2	MANAGEMENT ASSIST	- 1/4	- 14.29
O	9- 3	4	NCC LEASING	- 1/4	- 5.88
O	8- 2	2 3/4	SYSTEM CAPITAL	- 1/4	- 8.33
A	19- 3	11 1/8	U.S. LEASING	+ 3/8	+ 3.49

PERIPHERALS & SUBSYSTEMS

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK PERCENT CHANGE
N	62- 21	25 3/8	ADDRESSOGRAPH-MULT	+ 1 5/8	+ 6.84
O	15- 2	3 1/8	ALPHANUMERIC	---	----
N	48- 13	15 3/4	AMPEX CORP	- 1/2	- 3.08
A	34- 5	6 1/2	ASTRODATA	---	----
O	11- 3	6 172	BOLT,BERANEK & NEW	+ 1/2	+ 8.33
N	14- 6	7 1/8	BUNKER-RAMO	+ 5/8	+ 9.62
A	33- 13	15 3/4	CALCOMP	+ 3/8	+ 2.44
O	13- 4	4	COGNITRONICS	- 1/4	- 5.88
O	12- 4	5	COLORADO INST.	- 1 1/8	- 18.37
O	36- 8	8	COMPUTER COMMUN.	- 2	- 20.00
A	12- 3	3 7/8	COMPUTER EQUIPMENT	- 1/4	- 6.06
A	28- 13	17 1/4	COMPUTEST	+ 1/2	+ 2.99
A	35- 7	7 7/8	DATA PRODUCTS CORP	- 1/8	- 1.56
O	23- 6	6 3/4	DATA TECHNOLOGY	+ 1/4	+ 3.85
O	13- 5	5 3/4	DIGITRONICS	+ 1/2	+ 8.00
N	40- 7	9 1/4	ELECTRONIC M & M	+ 1 1/4	+ 15.62
O	8- 3	4 1/8	FABRI-TEK	- 1/4	- 5.71
O	17- 2	2 1/2	FARRINGTON MFG	---	----
O	20- 5	5 1/2	INFORMATION DIS	- 1/2	- 8.33
A	67- 14	16 1/4	MARSHALL INDUSTRIES	- 3/4	- 4.41
A	84- 15	18 3/8	MILGO ELECTRONICS	+ 1/8	+ 0.68
N	87- 19	22 5/8	MOHAWK DATA SCI.	+ 3/4	+ 3.43
O	52- 15	15 1/2	OPTICAL SCANNING	---	----
O	17- 4	4 7/8	PHOTON	+ 1/2	+ 11.43
O	4- 1	1 5/8	PHOTO-MAGNETIC SYS.	---	----
A	42- 16	18 3/8	POTTER INSTRUMENT	- 1 3/4	- 8.70
O	83- 15	18 1/2	RECOGNITION EQUIP	+ 3 1/2	+ 23.33
O	34- 5	5 1/4	REDCOR CORP.	---	----
N	29- 7	8 5/8	SANDERS ASSOCIATES	+ 3/8	+ 4.55
O	53- 7	7	SCAN DATA	---	----
O	23- 10	12 1/2	TALLY CORP.	- 1	- 7.41
N	25- 11	13 1/4	TELEX	+ 3/8	+ 2.91
O	50- 6	6 7/8	VIATRON	+ 5/8	+ 10.00

SOFTWARE & EDP SERVICES

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK PERCENT CHANGE
O	6- 2	2	ADVANCED COMP TECH	- 1/4	- 11.11
A	24- 4	4 3/4	APPLIED DATA RES.	---	----
O	18- 2	3 1/4	APPLIED LOGIC	- 3/4	- 18.75
O	8- 1	1 3/4	ARIES	---	----
A	47- 23	30 1/2	AUTOMATIC DATA PRC	+ 1 3/8	+ 4.72
O	14- 5	5 1/4	AUTO SCIENCES	- 1 1/2	- 22.22
O	9- 1	2	BRANDON APPL SYS	---	----
O	3- 1	1 1/2	COMPUTER AGE INDUS.	---	----
A	12- 2	3	COMPUTER APPL	---	----
O	14- 2	3	COMPUTER ENVIRON	---	----
N T	10- 2	5	COMPUTER INDUS.	+ 1	+ 25.00
O	13- 2	4 3/4	COMPUTER NETWORK	+ 1/2	+ 11.76
O	15- 5	6 1/2	COMP. PROPERTY	- 1/2	- 7.14
N	34- 7	9 3/4	COMPUTER SCIENCES	+ 1/4	+ 2.63
O	8- 3	3 1/2	COMPUTER USAGE	- 1/2	- 12.50
A	75- 16	20 1/2	COMPUTING & SOFT	+ 2 1/8	+ 11.56
O	9- 2	2 1/2	COMRESS	- 3/4	- 25.08
O	14- 2	3	COMSHARE	- 3/8	- 10.34
O	3- 1	1 1/8	CONSOL. ANAL. CENT.	- 1/8	- 10.00
O	24- 3	3 1/4	DATA AUTOMATION	- 1/4	- 7.14
O	28- 5	5 1/4	DATA PACKAGING	- 4	- 43.24
O	6- 1	1 3/8	DATAMATION SERVICE	- 3/8	- 21.43
O	9- 5	5	DATATAB	- 1	- 16.67
O	4- 1	2 1/4	DIGITEK	- 1/2	- 18.18
O	13- 5	5 1/2	EDP RESOURCES	- 1/2	- 8.33
A	11- 5	7	ELECT COMP PROG	+ 1	+ 16.67
A	161- 31	39	ELECTRONIC DATA SYS.	+ 1	+ 2.63
A	20- 4	5	INFORMATICS	- 2	- 28.57
A	25- 6	8 3/4	ITEL	+ 3/8	+ 4.48
O	13- 1	---	LEVIN-TOWNSEND SERV.	---	----
O	25- 9	10 3/4	MANAGEMENT DATA	+ 5/8	+ 6.17
O	8- 2	2	NAT COMP ANALYSTS	- 1/2	- 20.00
O	12- 3	6 1/2	NAT.COMP. SERV.	- 1/2	- 7.14
N	54- 13	17 1/4	PLANNING RESEARCH	+ 1 3/4	+ 11.29
O	27- 9	10 1/2	PROGRAMMING METHODS	- 1	- 8.70
O	5- 2	2 3/4	PROGRAMMING & SYS	- 1/8	- 4.35
O	33- 2	2 3/4	PROGRAMMING SCIENCES	- 1/2	- 15.38
N	22- 2	3 1/8	SCIENTIFIC RESOURCES.	- 1/4	- 8.70
O	2- 1	1	SOFTWARE SYSTEMS	---	----
O	27- 6	7	TBS COMP CENT INC.	+ 1	+ 16.67
O	4- 2	2 1/8	UNITED DATA CENTER	- 3/8	- 15.00
N	99- 19	22 1/2	UNIVERSITY COMP.	+ 1/8	+ 0.56
A	20- 4	5 1/8	URS SYSTEMS	- 5/8	- 10.87
O	13- 3	3 5/8	U.S. TIME SHARING	---	----

Earnings Reports

DATA TECHNOLOGY CORP.
Year Ended May 2

	1970	1969
Shr Ernd	a$.18	$.66
Revenue	16,626,818	13,041,504
Income	215,000	759,000
Spec Chg	d80,000	.....
Net Inc	b135,000	759,000

a-Based on income before special charge. b-Equal to 11 cents a share. d-Loss in connection with sale of a division.

DISC INC.
Year Ended Feb. 28

	1970	1969
Shr Ernd	$.19	.....
Revenue	3,793,269	$6,994,866
Earnings (Loss)	595,791	(765,967)

RECOGNITION EQUIPMENT
Six Months Ended April 30

	a1970	a1969
Shr Ernd	$.16	.....
Revenue	17,578,000	$11,485,000
Earnings (Loss)	795,000	(494,000)

a-Includes results of company's 58.8% owned Docutel Corp. subsidiary.

CSI COMPUTER SYSTEMS
Three Months Ended May 31

	1970	1969
Shr Ernd	$.01	.....
Revenue	357,414	$233,557
Earnings (Loss)	7,661	(42,608)

Acquisitions

Wellington Computer Systems, Inc. has acquired **Advanced Management Planning, Inc.**, a Bethesda, Md., consulting firm, for an undisclosed amount of stock. Advanced Management has been in business several years in Washington, D.C., providing consulting services for federal, state and local government divisions. It will operate under present management as Wellington's Washington office.

Slent Computer Corp. has acquired **Creative Developers Inc.** of Baton Rouge, La., for an undisclosed amount of Slent stock. Creative developers is a construction-oriented company with a novel method of shell construction utilizing low pressure spray concrete techniques. Creative Developers will become a division of Slent and change its name to Sheltron Construction and Engineering.

GTS Corp. of New Orleans, and **Computer Data Processors, Ltd.**, of Calgary, Alberta, Canada, have approved in principle a proposed merger. GTS is an international data processing organization specializing in the accumulation of petroleum exploration data banks and the application of new computer processing techniques to old photographically recorded seismic and well log information.

Avido Corp. has acquired **Technical Concepts, Inc.**, a Rochester manufacturer of electronic equipment. Terms of the acquisition was through an exchange of stock. TCI will be operated as a wholly owned subsidiary of Avido.

Computer Control Systems, Inc. of Dallas has agreed in principle to acquisition by Union Service Industries, Inc., Memphis, for about $1 million in stock. The deal is subject to approval of directors and stockholders of both companies.

UNPLANNED DEMONSTRATION

"Get the hell out of here, she's gonna go up!"
And boy, did she go up.

On November 13th, 1969, a single engine plane came in for a landing at Princeton Airport. Suddenly it nosed down and crashed into the ADR offices. Miraculously, no one was hurt.

The quote above came from the pilot of the plane. His prediction was correct. Gasoline splashed over the roof and walls and within seconds flames were roaring across the frame building. The photo above gives you some idea of extent of the fire and destruction. What you cannot see, however, is the remarkable story of what was saved, not lost.

ADR came through the crash, fire and flood with 95% of our software libraries intact and operable. Thanks to two of our own proprietary products, Librarian and Autoflow. We use Librarian as a source program retrieval and maintenance system. All major source programs are stored on tape in the Librarian master files. These tapes were removed from the burning building before they could be harmed. The equivalent

of over a quarter of a million cards had been placed on Librarian tapes. It would have taken four 20-drawer file cabinets to hold this many cards. These files could never have been saved. Even though innumerable card decks and vast quantities of printer output were totally destroyed, the work they represented, safely stored on Librarian tapes, was easily rescued. The information on these tapes, including commentary on the historical development of the source programs, enabled our programmers to get back to work in a fraction of the time that would have been necessary without Librarian.

Autoflow, our computerized flowcharting and documentation system, was the second hero of our saga. Autoflow made it possible to immediately regenerate flowcharts lost in the fire. Without Autoflow, manual re-creation would have been needed.

Try to explain what this costs to the fire insurance people.

We did it the hard way, but we think our unplanned demonstration proves quite a bit. Not all accidents, mishaps and losses will be as dramatic as ours. But you never know what will be lost, torn, mishandled or misplaced.

Librarian and Autoflow saved us inestimable time, money and effort. We never used the term before, but both products served as vital "insurance" in continuing our normal operations. But possibly in your business, this aspect is not important. After all, things like accidents and fires only happen to the other guy. For a planned, peaceful demonstration of Autoflow and/or Librarian, call or write:

Applied Data Research, Inc.

Route 206 Center, Princeton, N.J. 08540
609-921-8550. Offices in principal
U.S. and foreign cities.